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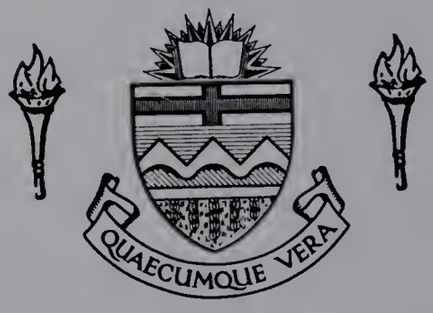

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DATED

THE UNIVERSITY OF ALBERTA

TEACHING BEHAVIOR OF GRADE FIVE GYMNASTIC TEACHERS

by

© GARTH N. PICKARD

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE DEGREE OF MASTER OF EDUCATION

EDMONTON, ALBERTA

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Teaching Behavior of Grade Five Gymnastic Teachers" submitted by Garth Norman Pickard in partial fulfillment of the requirements for the degree of Master of Education.

June 12, 197

ABSTRACT

Elementary physical education provides opportunities for children to learn from teachers' activities that are invigorating and developmental, and will lead to physical, social, mental, and emotional growth. Recent emphasis has been placed upon research designed to describe more percisely what goes on between teachers and students in classroom settings. Robbins (1973) developed an instrument to analyze teacher behavior in elementary school physical education in order that the interaction between teachers and students could be more accurately described and analyzed.

It was the purpose of this study, which utilized Robbins' (1973) instrument, to examine teaching behavior of elementary teachers in grade five gymnastics. The data obtained from thirty observations carried out during the study provided the imput with which to analyze the possibility of:

1. Identifying common teaching behaviors in elementary physical education grade five gymnastics.
2. Identifying, if any, intra-individual commonalities in teaching behaviors.

3. Identifying, if any, inter-individual commonalities in teaching behaviors.

Treatment of the data in either percentages or matrices (and flow charts) provided a clearer insight into what occurred in elementary physical education gymnastic lessons. The results of the study suggested that each teacher taught in a unique manner. Though no common inter-individual behaviors dominated, it was suggested by the results that some behaviors tended to be more prevalent than others.

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CHAPTER I

THE PROBLEM

INTRODUCTION

Physical education is regarded as a vital part of general education. Just as primitive man had to learn to use his body wisely or perish, so must modern man, for biologically they are almost identical. Physical education provides opportunities for the individual and the group to learn from teachers' activities that are invigorating, developmental, and will lead to physical, social, mental and emotional growth.

Physical education, along with most subject areas in the elementary school, is under-going change. In the process of developing new elementary school physical education programs, consideration has been given to sources of physical growth and development, motor learning, cognitive development, and development in the psychomotor domain. Combining such related fields to develop elementary physical education both North American and English writers have viewed this kind of education as "Movement Education" (Mauldon, Layson, 1965; Kirchner, Cunningham, and Warrell, 1973).

The basic aims of "Movement Education" have been stated by Mauldon and Layson (1965) as follows:

1. To assist children to become physically fit and skillful in a variety of situations. This requires the teacher to help children increase their co-ordination and flexibility of mind as well as body.
2. To teach children to understand movement so they can build movement sequences from their ever-increasing understanding of what, where, and how the body can move.
3. To encourage self-discipline and self-reliance so children can work on their own ideas individually, in pairs, or in a group.
4. To provide maximum enjoyment and the opportunities for creative express (p. 12).

Because of the significant change from the drill and calisthenic type programs to "Movement Education" programs, a wide variety of teaching methods are possible, a more informal environment may exist, and greater individual attention can be provided. When reviewing current elementary physical education curricula (Alberta, 1969; Manitoba, 1969; Ontario, 1967) the teacher is influencial in developing unit lessons, motivating for quality of performance, and encouraging a variety of responses in the areas of games, dance gymnastics, and other physical activities.

There has been a recent emphasis in research designed to describe more precisely what goes on between teachers and pupils in classroom settings. Smith and Meux (1962) developed thirteen

categories for viewing teacher behavior in classrooms. Bellack (1966, 1967) reported detailed analysis of what he referred to as "teaching cyles". Flanders (1960, 1966) provided a basic instrument for analyzing classroom behavior and Amidon and Hunter (1966) provided a translation of knowledge gained from the research in classroom verbal interaction into usable, practical course material Browne (1971) developed the OSAPRL and Robbins (1973) developed an instrument for analyzing teacher behavior in elementary school physical education. Those authors have contributed considerably to an understanding of what goes on between the teacher and the student in various educational environments.

As Gorman (1969) contends:

> ...decisions of any sort regarding past, present, and future practices in the organization of curriculum, staff, students, or physical plant will be ineffective if the interactive process of classroom learning is left untouched (p.8).

Thus knowledge relating the interaction between teachers and children is essential. It influences decisions as to which part of education will be retained and which areas of new knowledge and skill will be developed in depth and added to the repertoire of teaching and learning.

With reference to elementary physical education Robbins (1973) states:

> As yet, however, there is very little written about what goes on between teacher and pupil in elementary school physical education. Most "methods" books devote a great deal of space to the organization of students and to the planning of instruction but, merely glance over the important aspects of teaching behavior (p.6).

It may then be suggested that without fully understanding the "interactive process" existing in elementary physical education, the efforts to improve such programs will be difficult.

Robbins (1973) developed an instrument to analyze the teacher behavior in elementary school physical education. His research suggested that identification of common teacher behaviors in elementary physical education would be of value in assessing physical education instruction in schools. Research of this nature may attempt to identify teacher behaviors, determine common teacher behaviors and thus suggest that teaching styles tend to exist in elementary physical education.

PURPOSE OF THE STUDY

It was the purpose of this study to examine teaching behavior of elementary teachers in grade five gymnastics in order to identify common teacher behaviors in that situation. The

identification of predominant behaviors suggested that unique teacher behaviors may exist in the teaching of elementary physical education grade five gymnastics. The study focussed on the following questions:

1. Are there identifiable common teaching behaviors in elementary physical education grade five gymnastics?
2. What, if any, intra-individual commonalities in teaching behavior exist?
3. What, if any, inter-individual commonalities in teaching behavior exist?

While there was no intention to suggest that one particular behavior or style of teaching was superior to another, the study sought to identify common behaviors occuring in elementary grade five gymnastics.

SIGNIFICANCE OF THE STUDY

With the lack of research in the area of physical education, no identification of teaching behavior has been made. Similarly, no conclusions regarding the existance of common behaviors or styles of physical education teachers has been made.

As Colardarci (1957) suggests:

> If we knew for certain what the correct manipulations were (manipulations of learning environments to produce behavioral change), we would have any easy solution to questions about

educational procedures - we would have valid "rules" to follow (p.28).

Browne, implied the need for interaction analysis by stating that the system (OSAPRL) "may provide an instrument that will allow us to move ahead with the task of determining those behaviors that will insure the effective teaching of reading. (p.424)."

At present school systems attempt to improve the quality of physical education taught in elementary schools by providing detailed unit lesson plans, and conducting frequent inservice sessions for teachers. The introduction of interaction analysis might complement these attempts. Robbins (1973) feels, as do others who have utilized interaction analysis in other fields, that being able to understand what goes on between teachers and students in education would be beneficial to teachers and prospective teachers. Through this research a contribution toward discovering and understanding common teacher behaviors and styles may be made.

DEFINITION OF TERMS

1. Elementary School Physical Education - This term includes a program of physical activities for grade one through six.
2. Elementary School Physical Education Gymnastics - As exemplified in the Alberta Curriculum Guide for Physical Education (1969).

3. Interaction - This term refers to a relationship between persons such that "... the behavior of one is stimulus to the behavior of the other." (English and English, 1958, p. 270).
4. Teacher Behavior - The behavior patterns a teacher exhibits in performing instructional duties.
5. Teacher Style - The probable temporal patternings of the different types of interaction a teacher exhibits in an instructional situation.
6. Interaction Analysis - This phrase applies to those methods of observation which study behavioral transactions by coding spontaneous communication, arranging data into useful display, and analysing results in order to study patterns of teaching and learning. (Flanders, 1970, p. 1).

OUTLINE OF THE STUDY

The state of interaction analysis research in the area of physical education is at a very early stage. This study was therefore designed to be descriptive and exploratory in nature. "If very little is known about a phenomenon the way to begin investigation of it is to analyze the phenomenon itself (Smith and Meux, 1962, p. 8)".

Following Smith and Meux, the study utilized an

observation technique of data gathering. Robbins' (1973) instrument, designed to analyze teacher behavior in elementary school physical education was founded on Flanders' (1966) interaction analysis and Bellack's (1966) four "pedagogical moves". The instrument's purpose was "...to concentrate on the overt teacher behavior or 'teacher acts' (Robbins, 1973, p.17)," and also the overt pupil behaviors occurring within an elementary school physical education lesson. It had been suggested that such observations and analysis would prove beneficial, and contribute to the limited knowledge in this area.

LIMITATIONS OF THE STUDY

It is essential to recognize the limitation that the presence of an observer in the gymnasium during the teaching of a lesson may effect teacher behavior. While every attempt was made to exclude any value judgements which may be influencial to the study, the researcher recognized the possibility of this limitation.

DELIMITATIONS OF THE STUDY

The study was delimited to the gymnasium and physical education equipment of the schools; to the ten teachers employed by the Edmonton Public School Board 1973, 1974; to the examination of teacher behaviors of ten elementary grade five gymnastics teachers; to the use of only Robbins' (1973)

instrument for analyzing teacher behavior in elementary school physical education; to the three gymnastic themes utilized, and to the fact that no attempt was made to analyze the aspects of pupil to pupil interaction and behavior.

ORGANIZATION OF THE THESIS

It was the purpose of Chapter One to introduce the problem under study. Background information, including need, definitions of terms and limitations and delimitations basic to the study were also included.

Chapter Two provides the theoretical background necessary for the present study. Chapter Three describes the procedures used to carry out this study, while Chapter Four provides the findings and interpretations resulting from the application of the instrument for analyzing teacher behavior in elementary school physical education. Chapter Five summarizes the findings and describes conclusions and implications of this study.

CHAPTER 2

THEORETICAL FRAMEWORK

INTRODUCTION

This chapter provides the theoretical background basic to the present study. The chapter will review relevant research and theory in the area of interaction analysis and survey the significant literature pertaining to interaction analysis and physical education.

CLASSROOM INTERACTION ANALYSIS

Education has directed itself toward a guided inquiry approach, a method which Worth (1973, p.196) describes as "guiding each student in his search for bearings which apply to real-life interaction". It is the teacher's responsibility to account for the contribution he makes toward guiding children toward "human self-realization" and "self-transcendence". A critical dimension of such accountability lies with the teacher personally understanding the quality and quantity of teacher-pupil interaction.

Interaction analysis is becoming more common in the educational research milieu. It is concerned with the quality and quantity of verbal behavior or interaction in classroom settings. Although only one aspect of teacher behavior, interaction

is one of the most significant, since many of the functions associated with classroom teaching are implemented through verbal communications.

Research relating to teaching behaviors has increased considerably in recent years. At present, the use of techniques for observation and analysis of classroom interaction shows great promise as a means for assessing a teacher's verbal behavior. Such assessment may provide teachers with the information necessary to make them aware of the good and poor qualities of their teaching performance. This awareness might assist them in improving or changing their methods of instruction. An observational system of analysis is a systematic technique for identifying and analytically interpreting specific teaching activities. Of those presently available, the Flanders System of Interaction Analysis (FSIA) is widely known and used.

Flanders (1960) developed his observational system to analyze the direct/indirect influence within the classroom as indicated by the verbal interaction between the teacher and the student. The measure derived from the analysis (the indirect/direct rato) was intended to reflect the aspect of the "affective climate" of the classroom.

Flanders (1966) has generated (1) a set of categories, (2) suggestions which can be followed in application of the

instrument, (3) a procedure for observation, and (4) steps for tabulating data. Flanders' categories for identifying verbal behaviors are as follows:

INDIRECT INFLUENCE

(Teacher-Verbal Behavior)

1. ACCEPTS FEELINGS - accepts and clarifies the feeling tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included.
2. PRAISES OR ENCOURAGES - praise or encourages students action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying, "umhm?" or "go on" are included.
3. ACCEPTS OR USES IDEAS OF STUDENTS - clarifying, building, or developing ideas suggested by a student. As a teacher brings more of his own ideas into play, shift to category five.
4. ASK QUESTIONS - asking questions about content or procedure with the intent that a student answers.

DIRECT INFLUENCE

(Teacher-Verbal Beahvior)

5. LECTURING - giving facts or opinions about

content or procedure, expressing his own ideas, asking rhetorical questions.

6. GIVING DIRECTIONS - directions, commands or orders to which a student is expected to comply.
7. CRITICIZING OR JUSTIFYING AUTHORITY - statements intended to change student behavior from nonacceptable to acceptable patterns; bawling someone out; stating why the teacher is doing what he is doing, extreme self-reference.

(Student Talk)

8. STUDENT TALK-RESPONSE - A student makes a predictable response to teacher. Teacher initiates the contact or solicits student statements and sets limits to what the student says.
9. STUDENT TALK-INITIATION - Talk by students which they initiate. Unpredictable statements in response to teacher. Shift from 8 to 9 as student introduces own ideas.

With the introduction of interaction analysis by Flanders new avenues of research were made available. Bellack (1966), following a similar approach as Flanders, analyzed many teacher-pupil classroom interactions. Through such research, Bellack (1966) developed an analysis system which included pedagogical moves, teaching cycles, and various categories of meaning. The four pedagogical moves, basic to his system classified teacher

and pupil behavior into:

1. STRUCTURING - focussing on content or management and procedures.
2. SOLICITING - questions, demands or requests designed to elicit a verbal or non-verbal response.
3. RESPONDING - a response to a soliciting move.
4. REACTING - a move to modify the response or to evaluate it.

In reporting the findings of his research, Bellack noted that a smaller proportion of (1) Structuring behavior was evident in comparison to the other three types of moves. He dealt with (2) Soliciting and (3) Responding collectively as he contended that "the soliciting move", that is, through the indicative meaning of soliciting, the solicitor specifies the limits within which the agent addressed is expected to perform or respond.

In displaying the results of analysis, Bellack noted that teachers utilized 7.7 per cent of their moves for structuring 46.6 percent of their moves for soliciting, 5.5 percent of their moves for responding, and approximately 38.4 percent of their moves for reacting.

Flanders (1970) suggested that a working knowledge of the theoretical aspects of interaction analysis will benefit present or prospective teachers in improving their teaching

performance and enhance the learning environment. He states:

> An individual becomes more responsive to pupil ideas (level two) by learning how to code with categories of interaction analysis and by interpreting display from specimens of his own teaching and the teaching of another person (p.354).

This is supported by research of Lohman, Ober, and Hough, (1967), Finske (1967), and Boni (1969).

It may be inferred at this point in time, that such awareness to the potentials of interaction analysis is vital. It is interesting to note that though Flanders (1970) and Bellack (1966) suggest that interaction analysis is beneficial in improving education, neither have reported any application of their methods of investigating teacher behavior to elementary school physical education classes because, the original Flanders and Bellack systems were verbal systems and do not take into consideration the many physical actions involved in physical education.

INTERACTION ANALYSIS AND PHYSICAL EDUCATION

Reflecting on studies which directly or indirectly employ some form of interaction analysis, it is apparent that there has been relatively little application of such observational systems in describing and analyzing physical education lessons. However, Anderson (1971) stressed that "Descriptive analytic

research in physical education could provide the tools for inquiry as well as the data needed to intelligently monitor and guide the process of change (p.1)." A "process of change" which may include changes in teacher behavior or possibly curriculum.

Anderson's awareness of the possible immediate and potential advantage of such descriptive and analytic research allowed him to cite several crucial stages in his examination of interaction analysis and physical education. He suggests:

1. That the first stage would involve the development of systems which adequately describe events in teaching physical education.
2. A second stage would involve using the systems to acquire large samples of descriptive data which describe what is happening in physical education classes.
3. A third stage would allow the examination of the nature of existing and innovative methods.
4. A fourth stage would involve using the tools and the results of descriptive studies as a basis for conducting experimental and evaluative studies.
5. A final stage would involve the utilization of the accumulating body of information to enrich teacher education programs.

With the lack of documented literature pertaining to what transpires in an elementary physical education setting, it has been indicated by Robbins (1973) that physical educators are presently at stage one of Anderson's sequential suggestions.

Dougherty (1971) suggested a plan for the analysis of teacher-pupil interaction in physical education by modifying Flanders' system to include an eleventh category to account for meaningful non-verbal activity. Unfortunately he failed to report research on the actual use of the system. Barrett (1971) indicated that for both research and practice, it was essential to understand the teacher's verbal behavior while using problem solving in physical education lessons. Utilizing theoretical constructs of both Flanders' and Bellack's system of analysis, Barrett concluded that such analysis would provide a more comprehensive and accurate view of what the teacher did when using problem solving techniques.

Robbins (1973) was concerned that existing methods of analyzing teacher behavior "were not adequate to approach the task of accounting for many crucial events in the gymnasium (p.8)". With this concern Robbins (1973) developed an instrument to analyze teacher behavior in elementary school physical education. The instrument was an adaptation of the Flanders and the Bellack observable data gathering techniques. As a framework, Robbins turned to Bellack's four pedagogical moves: "teacher structuring", "teacher solicitation", "pupil response",

"teacher reacting".

Through investigation Robbins (1973) concluded that the instrument to analyze teacher behavior in elementary school physical education reached an acceptable level of inter-judgemental and intra-judgemental agreement.

Wesson (1973) investigated the effects of teacher behavior in elementary school physical education and the self-concept of pupils. He employed Robbins (1973) instrument by comparing the list of the effects of significant others and the development of the self-concept of the pupils with the type of teacher behaviors occurring in elementary school education as Robbins identified. Wesson reported tentative conclusions that if the behaviors of the teachers included positive traits, then the self-concept scores of their pupils would be higher, and if the behaviors of the teachers included negative traits, then the self-concept scores of their pupils would be lower. These decisive results suggested the importance of understanding and analyzing teacher behavior in physical education.

Smith (1974) utilized interaction analysis in swimming in order to substantiate a psychologically-based approach to teaching swimming.

SUMMARY

This chapter has provided a description of selected research which has been carried out in the area of interaction analysis and teacher behavior. This chapter has explored the

avenues available for analysis in the area of physical education and has provided a base for the present study.

CHAPTER 3

THE DESIGN OF THE STUDY

INTRODUCTION

It is the purpose of this chapter to describe the procedures used to carry out this study; selection of the population and sample, instrumentation, method of data gathering, and treatment of the data.

SELECTION OF THE POPULATION

The population consisted of male and female teachers employed by the Edmonton Public School Board during the academic year 1973-1974. The teachers held a permanent teaching certificate, a Bachelor of Education Degree, and had no more than ten years teaching experience. In addition the teachers in this population taught at least one co-educational grade five gymnastics class, and instructed the physical education classes between 1:00 p.m. and 3:30 p.m. Mondays, Tuesdays, Wednesdays and/or Fridays or between 9:00 a.m. and 9:30 a.m. Tuesdays.

Ten teachers were selected from the population and were approached to gain their approval. In one case this was not forthcoming and a replacement from the original population was drawn. It was assumed that these teachers were representative of the population.

INSTRUMENTATION

Taking account of the significant literature regarding teacher behavior and interaction analysis the writer selected the most current instrument for analyzing teacher behavior in elementary school physical education. This instrument was developed by Robbins (1973).

Robbins' instrument was an adaptation of the Flanders and Bellack observable data gathering techniques. As a frame work, Robbins utilized the four "moves" of "teacher structuring", "teacher solicitation", "pupil response", "teacher reacting", and a fifth area, "other".

Seventeen behavioral categories which Robbins developed under each of the instrument's five sections are included in Figure 1.

Both Robbins (1973) and Wesson (1973) have described the instrument for analyzing teacher behavior in elementary school physical education.

INSTRUMENT DESCRIPTION

The first major section TEACHER STRUCTURING includes introductory, organizing, planning and explaining, describing, and summarizing either physical education centered lecturing behaviors or non-physical education centered lecturing behaviors.

TEACHER STRUCTURING I	1.	Physical education centered structuring type behavior.
	2.	Non-physical education behavior.
TEACHER SOLICITATION II	3.	Command, authoritarian directive.
	4.	Limiting, restricting directive.
	5.	Open, free directive.
	6.	Teacher questioning.
PUPILS' RESPONSE III	7.	Pupils' verbal response.
	8.	Pupils' activity response.
	9.	Pupils' initiating action.
TEACHER REACTING IV	10.	Confirming performance reactions.
	11.	Confirming behavior reactions.
	12.	Correcting (rejecting) performance reactions.
	13.	Correcting behavior reactions.
	14.	Extending reactions.
	15.	Focussing reactions.
	16.	Demonstration.
OTHER V	17.	Silence or Confusion.

FIGURE 1
CATEGORIES FOR OBSERVING TEACHER BEHAVIOR
IN ELEMENTARY SCHOOL PHYSICAL EDUCATION

CATEGORY ONE - PHYSICAL EDUCATION CENTERED STRUCTURING

TYPE BEHAVIORS - teacher behavior directly related to the physical education lesson, but not intended to solicit an overt response from the pupils nor to be a reaction to pupils' response.

EXAMPLE - "Today we are going to work on different ways of travelling."

or

"We have been working on different ways of taking our weight. Next lesson we are going to use what we have learned today and begin working with a partner.

or

taking out or putting away physical education equipment.

CATEGORY TWO - NON-PHYSICAL EDUCATION CENTERED LECTURING

TYPE BEHAVIORS - is explained as any teaching behavior that is not related to the physical education lesson. Since this category does not solicit a response from children it is considered to be a structuring behavior.

EXAMPLE - "The principal has asked me to announce that those in the school play will have a practice tonight."

The second major section, that of TEACHER SOLICITATION has been clearly sub-divided into four behavior categories. Teacher soliciting behaviors are intended to elicit responses from the pupils. The directives are categorized by the degree of teacher control or freedom given to the pupils.

CATEGORY THREE - COMMAND, AUTHORITARIAN DIRECTIVE - is described as a soliciting behavior which requires that the pupils provide one response only.

EXAMPLE - "Stand-up" or "Bring me the ball."

CATEGORY FOUR - LIMITING, RESTRICTING DIRECTIVE - is explained as a solicitation which limits the pupils by exercising some degree of control.

EXAMPLE - "Show me a balance on your hands and feet." (the action and body parts are restricted, but the level and shape of the body are left free to the child's imagination).

CATEGORY FIVE - OPEN, FREE DIRECTIVE - is a solicitation behavior which allows the children to move without restriction (many responses therefore, would be observed).

EXAMPLE - "Travel by whatever method you choose and use all the space."

CATEGORY SIX - TEACHER QUESTIONING - consists of any questions

that the teacher asks during a lesson.

EXAMPLE - "How are you balancing Rick?" or "Where is your hoop Jean?"

Categories seven, eight, and nine make up the third major section of Robbins' (1973) instrument - PUPIL RESPONSE. This section was designed to record the responses of the children to the soliciting categories (3,4,5,6). Both verbal and activity responses are acknowledged.

CATEGORY SEVEN - PUPILS' VERBAL RESPONSE - signifies any verbal or non-verbal action (nodding the head) which are answers to teacher questions.

EXAMPLE - TEACHER - "Who can show me a different balance?"
PUPIL - "I can." (or putting up a hand).

CATEGORY EIGHT - PUPILS' ACTIVITY RESPONSE - is described as the physical activity response by pupils resulting from a teacher directive or teacher question.

EXAMPLE - Locomotive, balancing or apparatus activities.

CATEGORY NINE - PUPILS' INITIATING ACTIVITY - is explained as whenever a pupil of his own volition initiates interaction with the teacher.

EXAMPLE - "Watch me, Mrs. Lorenson!"

The fourth section - TEACHER REACTION is subdivided into seven categories all of which classify the reaction responses or behaviors which a teacher exhibits in relationship to the pupils responses. Such reactions have been so divided by Robbins (1973) into the following areas: teacher confirming (praise), teacher correcting (criticism), teacher extending (coaching), teacher focussing (coaching), and demonstrations.

CATEGORY TEN - CONFIRMING PERFORMANCE REACTION - is praise, encouragement of physical activity responses which are carried out or executed by the pupil.

EXAMPLE - A reaction may result after a child playing a game makes a good pass and the teacher reacts - "Well done Norman!"

CATEGORY ELEVEN - CONFIRMING BEHAVIOR REACTION - is described as reaction behaviors that relate to the general deportment, propriety, or manners of the pupils as well as the way they treat others.

Although teacher confirming behavior did not occur in the observed lessons, Robbins (1973) considers it worthy of consideration from a theoretical standpoint.

CATEGORY TWELVE - CORRECTING (rejecting) PERFORMANCE REACTIONS - is described as when the teacher is indicating to the pupil or pupils that their

response(s) to the solicitation is/are not acceptable.

EXAMPLE - "Dianne, that is not right. You are to balance on your hands and feet only".

CATEGORY THIRTEEN - CORRECTING BEHAVIOR REACTIONS - The teacher is correcting the general deportment of the class or of a particular pupil.

EXAMPLE - "Class, you are making far too much noise."

CATEGORY FOURTEEN - EXTENDING REACTIONS - is described as behaviors that are intended to extend the performance of the pupils' relationship to the variety of responses made.

EXAMPLE - "You have been travelling on your feet. Now, sometimes use one foot and sometimes two feet."

CATEGORY FIFTEEN - FOCUSSING REACTIONS - is described as behaviors that are intended to improve the performance of the pupils.

EXAMPLE - "Curl-up more when you do that roll."

CATEGORY SIXTEEN - DEMONSTRATION - is concerned with both pupil and teacher behaviors related to demonstrations. The demonstrations can be the purpose of illustration, clarification, and extending or focussing on particular aspects of the soliciations or the responses.

The fifth section has been labled by Robbins (1973) as OTHER. Only one category has been placed in this section.

CATEGORY SEVENTEEN - SILENCE OR CONFUSION - contains all the other teacher or pupil behaviors which cannot be classified in any other category.

EXAMPLE - Category Seventeen would be coded if there was complete silence in the gymnasium or if the pupils in mass, were not working well and the noise level was extremely high.

Noting Figure 1 the numerals adjacent the behavior categories are the codes which are used when observing and gathering data. An example of coding interaction, which may occur in an elementary physical education lesson can be found in Appendix A. An anecdotal record of any note worthy happenings was recorded on the tape to assist in the interpretation of the data.

METHOD OF DATA COLLECTION

BACKGROUND

The method of data collection strictly demanded the objectivity and reliability of an observer. A training program with such specific criteria was therefore essential. Since such a program was a major component in Robbins' (1973) research the writer employed it. See Appendix B. The objective

of the training manual was to introduce the observer to a system of analyzing teacher behavior in elementary school physical education.

Robbins (1973, p.46) stressed that the prospective observer first learn the sections of the instrument, the categories sub-dividing each section and apply such knowledge to categorizing transcripts of lessons and live observations. For such an instrument which included seventeen categories, and was used in live observations in gymnasia, Robbins (1973, p.60) suggested that a Scott's Coefficient of between .75 an .80 would be acceptable. See appendix C for a description and calculation of Scott's Coefficient.

OBSERVER TRAINING

The training of the observer (the researcher of this study) was undertaken in early February, 1974, under the direction of Dr. S. G. Robbins, Associate Professor at the University of Alberta. The total training period lasted approximately thirteen hours and utilized; lesson transcripts, video-taped lessons, and live observations.

The observer was first tested for objectivity after practice coding with the instrument had taken place with the use of the lesson transcripts and the video-taped lessons. A cassette tape recorder, using two microphones, was used to record the categories selected by the observer and the examiner simultaneously. The tape was then transposed to vertical lists

of categories maintaining the original order of events. Scott's Coefficient of .81 was recorded. See Appendix C. Although this result was within the limits of objectivity, as described by Robbins (1973, p. 189) it was recommended that a live observation would be beneficial.

Arrangements were made in late February, 1974 to observe a grade five co-educational gymnastics class held in an Edmonton Public School. Both the observer and the examiner observed and coded the lesson. Through similar procedures (See Appendix C) a Scott's Coefficient was calculated to be .95 which was above the acceptable .80. Thus it was concluded that the observer was objective.

Approval for conducting the research was granted on February 21, 1974. See Appendix D. The sample was selected by the writer and the assistant supervisor of physical education for the Edmonton Public School Board.

Prospective teachers in the sample were personally contacted and the research project and their duties were explained to them. Ten of the teachers consented to partake in the study and appropriate time schedules were developed. Letters were circulated to each of the ten teachers and their principals advising them of the deletions and additions related to the arrangements previously made concerning the project. Included in this correspondence was the time table for observations and a description of the general gymnastic themes that were to be

used for each consecutive lesson. See Appendix E.

The three gymnastic themes were selected to be used concurrently with the three lessons taught by each of the ten teachers. This provision was implemented in order to provide similarity in lessons taught. The first gymnastic lesson taught by all ten teachers emphasized Body Shape. The second gymnastic lesson taught by all ten teachers emphasized Locomotion, and the third emphasized Space. A description of the gymnastic themes may be found in Appendix F.

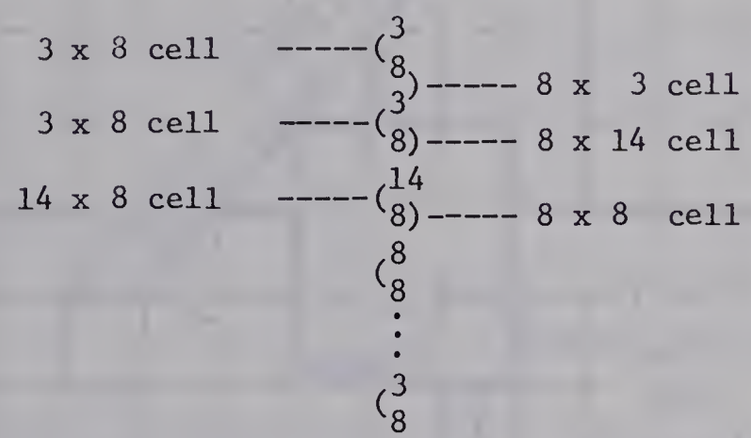
Each participating teacher was to be observed three times. A cassette tape recorder was used by the observer to code the behaviors of each lesson. A three second time signal was superimposed on the tape. The codes on the tape were then transposed to vertical tally lists where upon the codes were either treated in percentage form or consecutively paired and plotted on matrices. Although teacher absence occurred during data collection, the researcher was able to complete all thirty observations.

TREATMENT OF THE DATA

Utilizing the numerical codes provided by Robbins' (1973) instrument, a total of the tallies per category were obtained. In order to compare the teachers with respect to the total tallies in each of the other two lessons observed, the tallies obtained from the observations were paired from

the top of the vertical tally lists and plotted in the corresponding cell in a matrix. Except for the first and last category numbers, each number appeared in two successive pairs, first as the second number of a pair, then as the first number of the next pair.

TALLIES



Note: the first number in each pair represents the row on the matrix, the second number in each pair represents the column.

This procedure was repeated for each of the three lessons the ten teachers taught. Through such matrices, flow diagrams were developed which expressed the behavior patterns or cycles a teacher exhibited.

Figure 2 (Robbins, 1973, p.87) shows in general, the areas of the matrix into which certain patterns or cycles of behavior may fall.

The Command-Response cycle is represented by tallies moving from square 3-8 to square 8-3. This exhibits a pattern in which the teacher gives direct solicitations which is followed by a pupil response. The Teacher Coaching cycle is represented

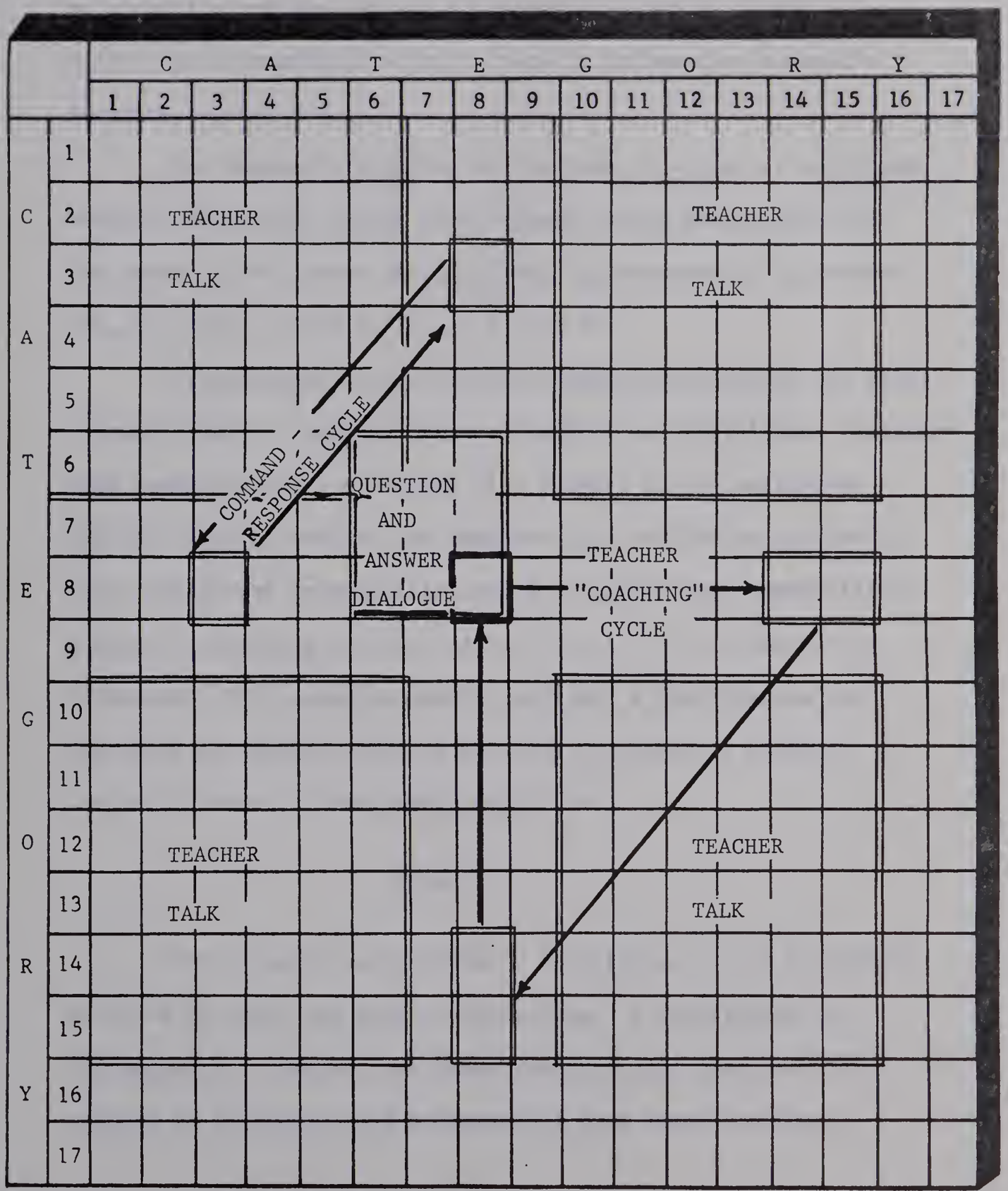


FIGURE 2
AREAS OF THE MATRIX INTO WHICH PATTERNS OF BEHAVIOR WILL FALL

by a pupil's response square 8-8 being followed by square 8-14 or 8-15 (coaching) which in turn is followed by a pupil's response, square 8-8.

The teacher's reaction in the form of praise or confirming behavior falls into square 8-10, square 10-10, and square 10-8, The Question and Answer Diologue cycle is represented by squares 6-6, 6-7, 6-8, 7-6, 7-7, 7-8, 8-6, and 8-7.

A percentage of tallies per category for each of the three lessons taught by each of the ten teachers was calculated. Teachers were compared with the average with respect to the percentage of tallies in each category and compared with each other to identify intra-individual commonalities and inter-individual commonalities. A matrix containing all the tallies for all thirty lessons was developed. This composite matrix provided a flow diagram which expressed the general type of patterns or cycles of behavior the ten teachers of the sample exhibited.

SUMMARY

This chapter has provided a description of the procedures utilized to carry out this investigation. A description of the population, sample, instrument used for the study and the methods of collection and treatment of data were furnished.

CHAPTER FOUR

RESULTS AND DISCUSSION

INTRODUCTION

The purpose of this chapter is to present a detailed analysis of the data. The results of this study have been displayed in three distinct sections.

The first section provides insight into the possibility of identifying common teaching behaviors in elementary physical education grade five gymnastics. Total tallies range and average percentage scores, a matrix, and a flow chart which revealed the combined thirty lessons of the ten teachers, described the general "average" behaviors.

Section two displays ten separate teacher profiles. Category percentage scores, combined category percentage scores, lesson matrices and flow charts jointly describe the profile of each teacher. These ten profiles provide insight into the possible common intra-individual teaching behaviors that may exist.

The third section, utilizing the average percentage per category per teacher data, provides an understanding into the possible common inter-individual teaching behaviors that may exist.

It is important to stress that no value judgements were made in regards to the data presented.

SECTION ONE - GENERAL "AVERAGE" BEHAVIORS

The data relating to the average percentages and tallies of the behavior categories provided insight into understanding identifiable common teaching behaviors. It was suggested by the work "common" that similarities in teaching behavior may exist among grade five gymnastic teachers.

From Table 1 it was observed that teachers in the sample tended to use soliciting behaviors more than structuring behaviors. For these two sections of the instrument (1. Structuring, 2. Soliciting) the total percentage for both was 24.4 percent of the total tallies. Of this, 44.6 percent were structuring teacher behaviors (Categories 1,2 and 55.4 percent were soliciting teacher behaviors (Categories 3,4, and 5).

Although Robbins includes category 6 under Teacher Solicitation it was found that it was difficult to distinguish whether the teacher questions were of a structuring soliciting or reacting nature. Robbins placed Category 16 under the Reacting section, but in practice the demonstrations were found to be performed by both the teacher and/or the pupil. Categories 6 and 16 although providing useful information, were therefore not included when combining categories.

In comparing the total number of teacher reacting behaviors (Categories 10, 11, 12, 13, 14, and 15) teachers

reacted to 37.1 percent of all the pupil responses. This was approximately a 4 : 1 ratio - pupil activity response to teacher reaction. Of this percentage (37.1%) 66.7 percent of the teacher reacting behaviors occurred in Categories 14 (36.4%) and 15 (30.0%) both coaching categories. This suggested that the teachers were more prone to reacting in a positive way toward pupil activity responses in order to increase the variety and quality of pupil activity. "Praise" (Category 10) for such pupil activity equaled .2 percent. This indicated that generally the teachers priased or encouraged their pupils only when their physical activity response (Category 8) was sound in quality and variety.

The total average percentage for solicitation equaled 13.5 percent of all the tallies coded. Of these 64.1 percent represented Category 3 (command, authoritarian directive); 35.7 percent represented Category 4 (limiting restricting directive); and .2 percent represented Category 5 (open, free directive). This suggested that the teachers maintained complete control over the pupils activity responses for two thirds of the solicitations.

Comparing "praise" (Categories 10 and 11) and "criticism" (Categories 12 and 13), Table 1 illustrated that 59.7 percent of the tallies for these categories were calculated for "praise" where as 43.3 percent were calculated for "criticism". These percentages indicated that the teachers in the sample tended to confirm pupil performance or behavior more than correcting or

TABLE 1

THE TOTAL TALLIES, RANGE AND AVERAGE PERCENTAGE PER CATEGORY FOR ALL LESSONS IN GRADE FIVE GYMNASTICS

	ALL LESSONS	
CATEGORY	AVERAGE %	RANGE
1	10.56	1.61 - 29.76
2	.33	0.00 - .79
3	8.68	4.97 - 14.23
4	4.83	2.75 - 6.48
5	.03	0.00 - .31
6	2.60	.69 - 4.04
7	2.32	0.00 - 3.95
8	42.90	31.37 - 50.21
9	.64	.34 - 1.41
10	3.22	.96 - 8.42
11	0.00	0.00 - 0.00
12	.98	.41 - 1.44
13	1.48	.12 - 3.26
14	6.19	3.77 - 7.74
15	5.16	2.40 - 9.94
16	6.54	3.47 - 11.37
17	3.36	.34 - 9.87

TOTAL TALLIES FOR ALL THIRTY LESSONS = 19,590

rejecting pupil performance or behavior.

Of the total teacher reaction section to pupil activity response (Categories 10,12,14, and 15) Category 10 (confirming performance behavior - "praise") represented 20.7 percent Category 12 (correcting performance behavior - "criticism") equaled 6.3 percent, Category 14 (extending performance behavior - "coaching") equaled 39.8 percent and Category 15 (focussing performance behavior - "coaching") equaled 33.2 percent of teacher reactions to pupil activity responses. These percentages suggested that on the average, the teachers tended to promote and help physical activites rather than correct or reject physical activities which the pupils were involved in.

Regarding teacher criticising pupil behavior (Category 13) Table 1 indicated that 1.5 percent of the tallies for this teacher reacting behavior occurred. This suggested that either the pupils' behavior was good a majority of the time during the lessons, or, the teachers tended not to concern themselves, to any large extent, with correcting pupil behavior. Referring to Category 17 (silence and/or confusion) 3.4 percent was recorded. Because of this percentage, the former statement was considered more suitable.

Considering total "teacher talk", (Categories 1,2,3,4,5,6, 10,11,12,13,14, and 15) the total tally percentage of those eleven categories equaled 44.1 percent. Of this percentage, 24.7 percent of "teacher talk" was calculated for teacher structuring behaviors; 36.6 percent of "teacher talk" was calculated for teacher soliciting behaviors; and 39.7 percent of "teacher talk" was

calculated for teacher reacting behaviors. This suggested that the teachers in the sample reacted to pupil activity as much as soliciting behavior and more than structuring behavior. ie. Structuring or Soliciting.

Referring to the range differences which occurred, an interesting span from 1.6 percent to 29.8 percent was observed for Category 1 (physical education centered structuring type behavior). This range was possibly due to the amount of time spent during each lesson in getting out and putting away gymnastic equipment. In some lessons equipment was not utilized.

An evident variation was observed for Category 3 (command, authoritarian directive) as Table 1 illustrated a 5.0 percent to 14.2 percent range. Regarding the pupil activity responses (Category 8) a range difference of 18.8 percent was observed.

Matrix 1 and Figure 3 describe the total tallies for all of the thirty lessons as consecutively paired, and the possible general "average" behavior frequency of grade five gymnastics teachers.

Generally, teachers would begin a lesson with some type of pupil activity. That activity may be running, jumping or an activity which had been introduced in a previous lesson. Physical education type structuring behavior would be the behavior following in order to set the pattern for the lesson. Following a structuring type behavior the teacher would utilize a command directive to begin physical activity. It was noted that the

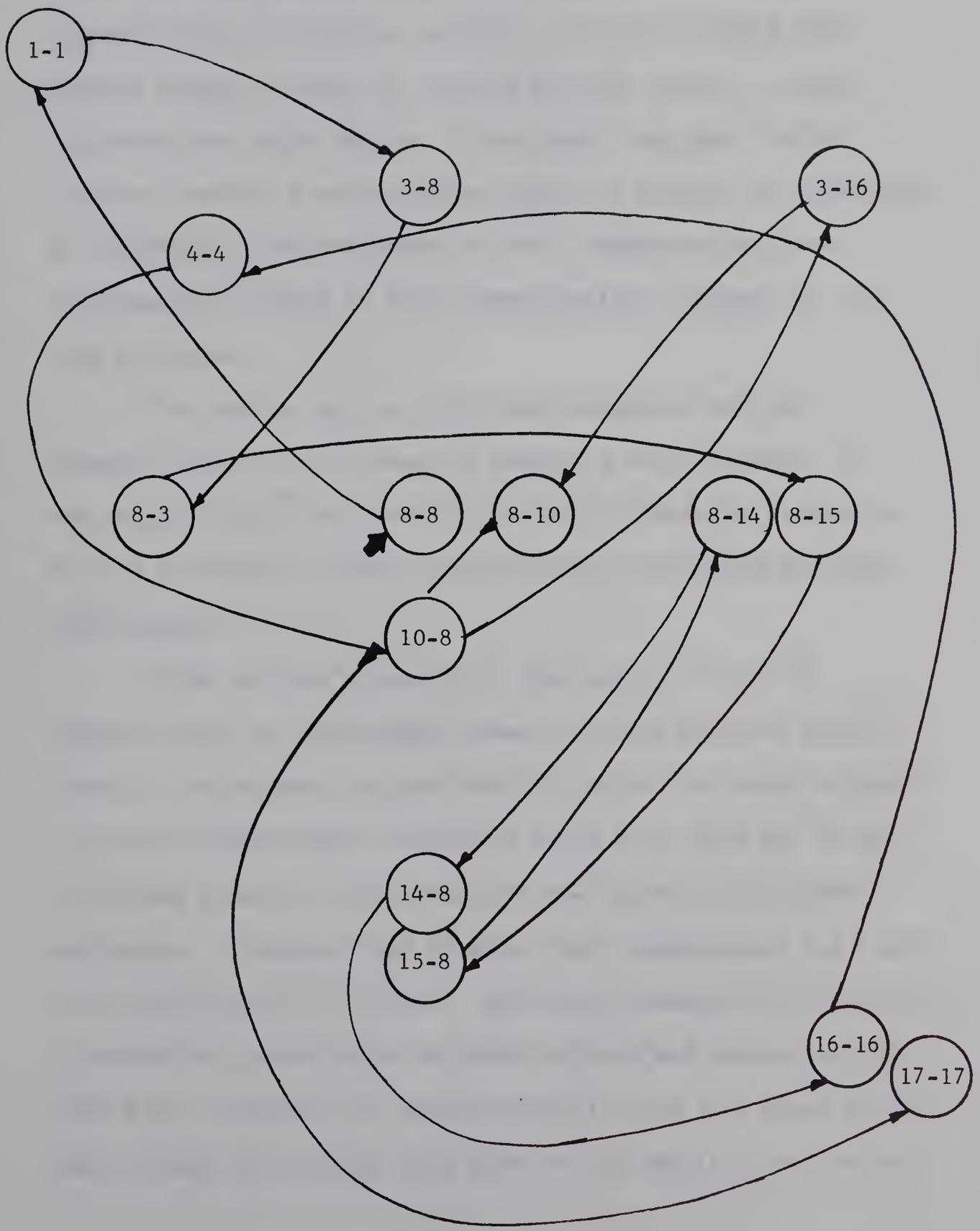


FIGURE 3
GENERAL BEHAVIOR FREQUENCY
FLOW CHART FOR ALL TEN TEACHERS

the teachers tended, when giving direct commands, to be short and to the point as indicated by the lack of 3-3. The pupils responded with the physical activity desired, whereupon the teacher tended to coach for quality and then variety. Limiting directives might follow. It was noted that when teachers utilized limiting directives they tended to prolong the discussion as indicated by the occurrence of 4-4. Demonstrations were encouraged and during or after demonstrations "praise" for the work was given.

The matrix and the flow chart suggested that all behavior cycles, as discussed in Chapter 3 were involved. It was interesting to note that silence and/or confusion tended to be more predominant in the general behavior cycle than may have been expected.

From the data presented in this section it may be suggested that an identifiable common teaching behavior exists. However, the behavior pattern would be subject to change because of various uncontrolable situations which arise from day to day. The common behaviors which fall into the behavior cycles were noticeable. Teachers tend to give direct instructions and coach for either quality or variety. They employ demonstrations possibly to extend the capabilities of other children and praise for work well done. Generally the teachers tend to talk to a large extent, thus perhaps limiting the time spent by the pupils in activities.

SECTION TWO - TEACHER PROFILES

The data relating the category percentage scores, combined category percentage scores and the plotted matrices and flow charts provided insight into understanding the possible common intra-individual teaching behaviors that each teacher may have. With this data it was possible to compare each of the three lesson a teacher taught thus providing an avenue with which to describe possible similarities occurring from lesson to lesson.

TEACHER PROFILE 1

Matrices 2,3 and 4, (See Appendix G) and Table 2 describe the lessons taught by Teacher 1. Teacher 1 showed a tendency to use a high proportion of coaching throughout all three lessons. He utilized similar amounts of structuring and showed the command-response cycle. It was interesting to note that Category 17 (silence and/or confusion) did not fluctuate to any large degree. During lesson 1, there were 16 demonstrations as compared to 7 in Lesson 2 and 9 in Lesson 3. The demonstrations however, in Lesson 2 tended to be longer (square 16-16).

Figure 4 illustrates the possible behavior frequency for Teacher 1. Pupil activity would be followed by physical education type structuring behavior which in turn would be followed by a command directive. The behavior cycle would continue to limiting directives which would be followed by pupil activity and

TABLE 2

CATEGORY PERCENTAGE SCORES

TEACHER 1 - LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	9.42	14.65	11.69
2	.67	.41	.43
3	8.74	4.75	8.37
4	3.14	3.66	5.77
5	0.00	0.00	0.00
6	1.57	2.85	1.44
7	1.35	3.39	1.73
8	40.13	44.37	39.25
9	1.57	1.22	1.44
10	2.69	1.09	1.59
11	0.00	0.00	0.00
12	1.57	.95	1.15
13	2.69	2.17	4.91
14	8.52	5.29	6.06
15	10.76	7.06	6.35
16	4.26	3.12	3.03
17	2.91	5.02	6.78

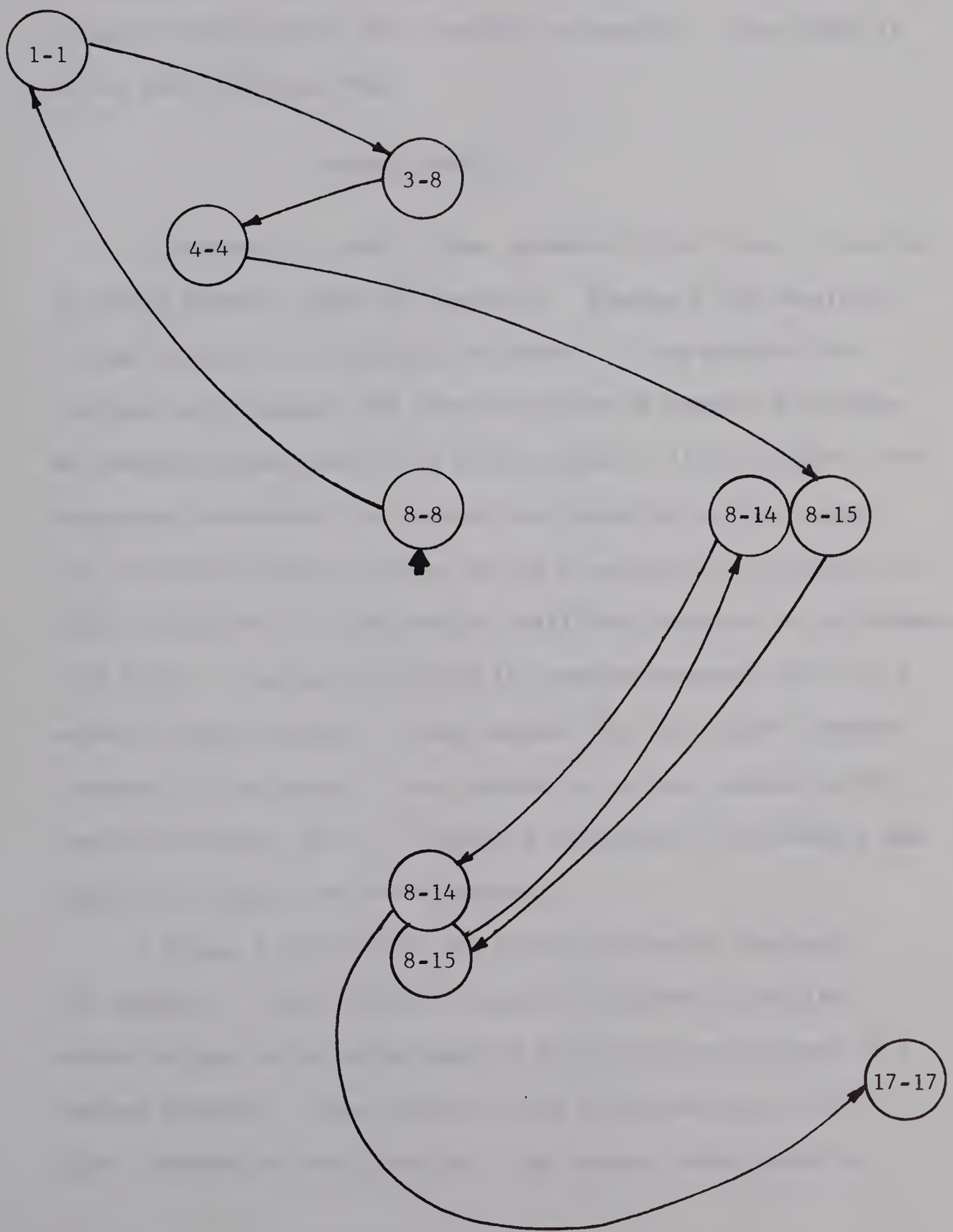


FIGURE 4
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 1

coaching. The pupil activity would result in either silence or confusion. Teacher 1 showed some variation in the "criticising" categories and also in the "coaching" categories. (See Table 12 at the end of Section Two).

TEACHER PROFILE 2

Matrices 5,6, and 7, (See Appendix G) and Table 3 describe the three lessons taught by Teacher 2. Teacher 2 was consistent to some extent in her teaching behavior. It was noticed that she gave approximately the same proportion of command directives as limiting directives in all three lessons. Also, Teacher 2 was consistent throughout the lessons for criticism in the lessons. The "criticism" cycle is shown by the occurrence of a Category 12 after a Category 8. This teacher criticised behavior or performance very little. Teacher 2 utilized the command-response cycle as a method of solicitation. It was noticed that with fewer commands (Category 3) in Lesson 1 there tended to be less silence and/or confusion (Square 17-17). Teacher 2 coached for both variety and quality in each of the three lessons.

Figure 5 illustrates the possible behavior frequency for Teacher 2. Pupil activity would be followed by physical education type structuring behavior which would be followed by a command directive. The behavior cycle would continue to the pupil response to the directive. The teacher would coach for

TABLE 3

CATEGORY PERCENTAGE SCORES

TEACHER 2 - LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	18.19	10.80	6.99
2	.14	1.77	0.00
3	5.36	9.91	11.21
4	2.96	6.19	4.37
5	0.00	0.00	0.00
6	3.10	3.19	3.06
7	3.10	3.89	4.37
8	42.03	42.65	43.09
9	1.13	.71	.29
10	4.23	1.95	1.89
11	0.00	0.00	0.00
12	.56	.53	2.18
13	2.26	3.36	1.89
14	4.09	3.72	7.13
15	8.04	5.84	2.77
16	4.80	1.59	8.73
17	0.00	3.89	2.04

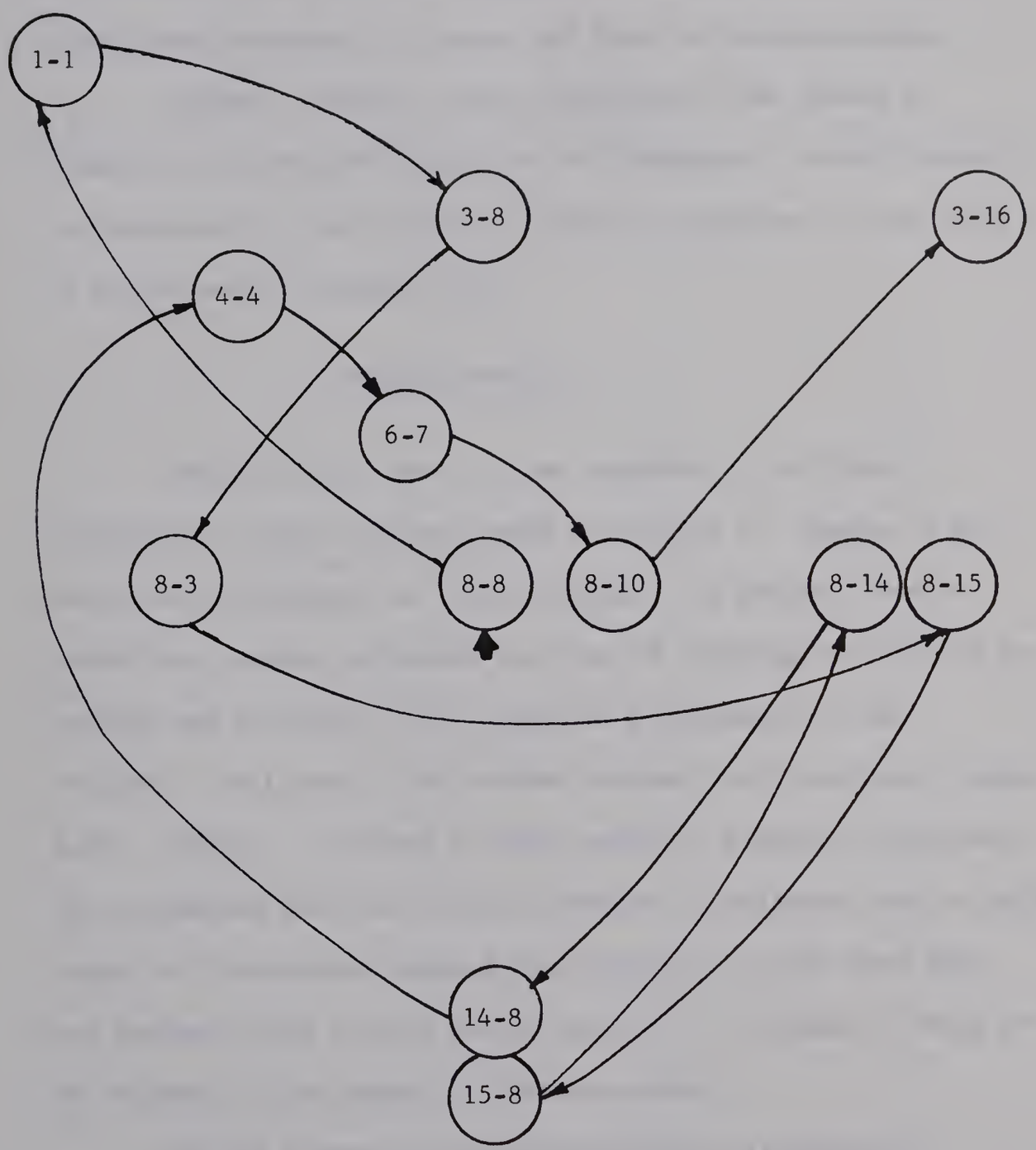


FIGURE 5
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 2

quality and then variety. From pupil activity, resulting from the coaching, the cycle would move to limiting directives, to questioning dialogue, to praise and then to demonstrations.

Teacher "tended to show consistency from lesson to lesson in the combined categories of "coaching". Also, Teacher 2 was consistent in her over-all reaction categories. (See Table 12 at the end of Section Two).

TEACHER PROFILE 3

Matrices 8,9, and 10, (See Appendix G) and Table 4 describe the three lessons taught by Teacher 3. Teacher 3 was consistent throughout all three lessons. An obvious pattern which this teacher exhibited was that of coaching for quality and variety and praising (8-10, 10-8) the performance of the children. In Lesson 1 the teacher praised pupil activity a great deal. Teacher 3 utilized a large amount of limiting directives. This suggested that the teacher provided a challenge with a limited degree of freedom and coached the children in order that they may improve their variety and/or quality. In Lesson 3, there was an increase in the number of demonstrations.

Figure 6 shows the possible behavior frequency for Teacher 3. Pupil activity would be followed by structuring behavior which in turn would be followed by coaching. Concurrently, praise for pupil activity would be apparent. The cycle would

TABLE 4

CATEGORY PERCENTAGE SCORES

TEACHER 3 - LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	4.27	6.44	3.10
2	.10	.15	.44
3	4.18	5.12	5.61
4	6.06	6.88	6.50
5	0.00	0.00	0.00
6	3.78	2.05	4.58
7	2.88	2.34	3.55
8	40.06	53.73	45.79
9	1.29	.29	1.62
10	11.73	5.86	7.68
11	0.00	0.00	0.00
12	.50	.73	0.00
13	2.49	2.05	.44
14	4.37	4.83	9.90
15	12.13	2.78	3.25
16	3.08	3.51	5.61
17	3.08	3.22	1.92

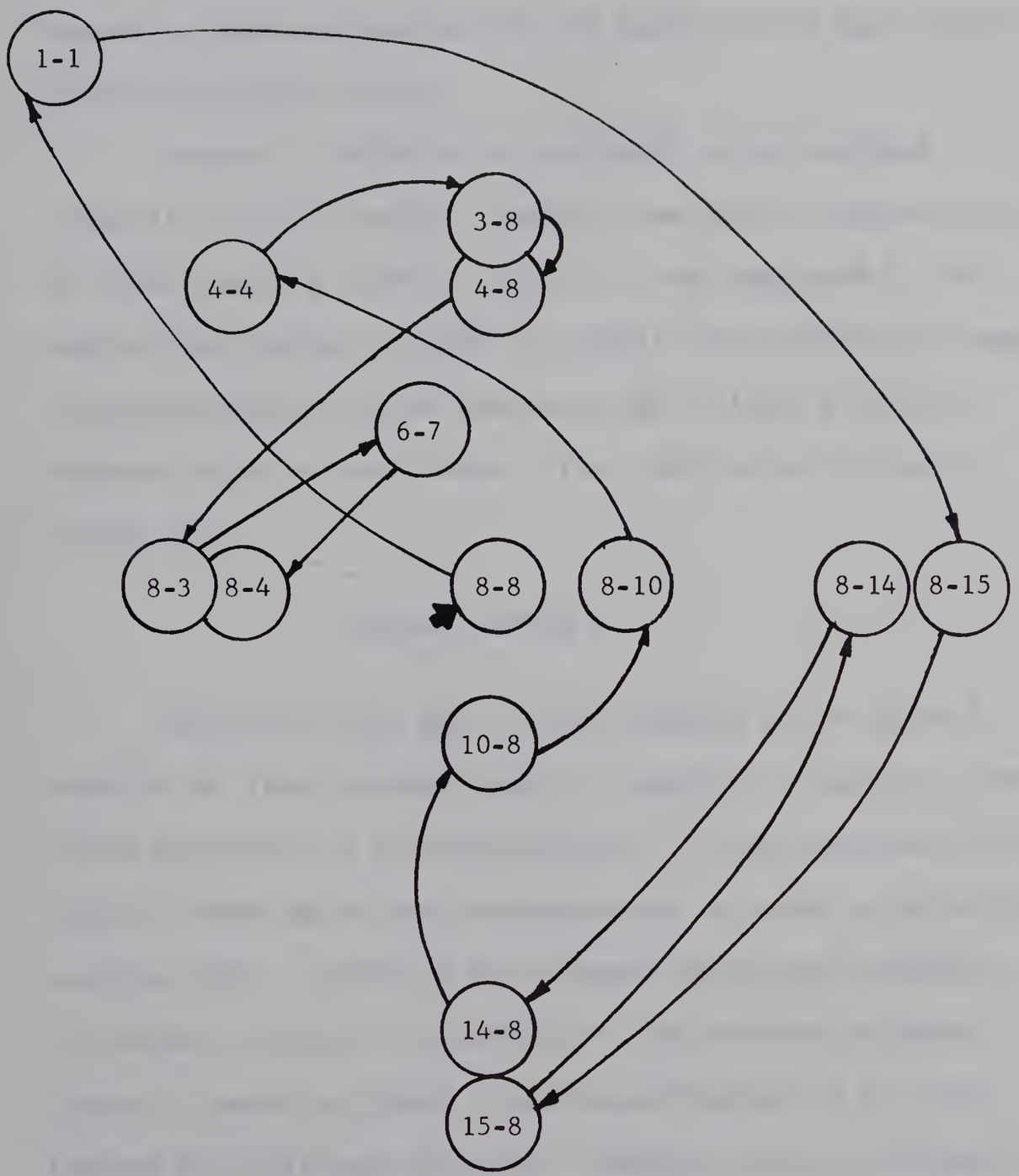


FIGURE 6
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 3

continue to limiting directives which would be followed by a command directive or a limiting directive. Pupils would respond to the solicitations and the teacher would again coach for quality and/or variety.

Teacher 3 tended to be consistent in the combined categories of solicitation. However, the results representing her total reacting behavior varied. It was suggested by such results that Teacher 3 tended to exhibit intra-individual common teaching behaviors in that generally she followed a similar behavior cycle for each lesson. (See Table 12 at the end of Section Two).

TEACHER PROFILE 4

Matrices 11,12, and 13, (See Appendix G) and Table 5 describe the three lessons taught by Teacher 4. Teacher 4 used a high proportion of coaching behavior. It was suggested that Teacher 4 made use of many demonstrations in order to enrich his coaching cycle. Teacher 4 made command directives frequently, but tended to explain the tasks in a less restrictive manner. Teacher 4 tended to praise a considerable amount of all three lessons and criticized the pupils' behavior and/or performance ver little. A noticeable question answer dialogue appeared in Lesson 2 and Lesson 3.

Figure 7 shows the possible behavior frequency for Teacher 4. Pupil activity would be followed by a command

TABLE 5

CATEGORY PERCENTAGE SCORES

TEACHER 4 - LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	4.27	3.66	9.04
2	.23	.37	.51
3	11.19	10.00	6.62
4	2.88	7.20	7.52
5	0.00	0.00	0.00
6	1.85	6.59	3.69
7	.92	6.46	4.46
8	47.87	33.05	33.76
9	.58	1.22	.51
10	3.69	4.88	4.20
11	0.00	0.00	0.00
12	1.85	.98	1.15
13	.81	.73	1.27
14	7.27	8.05	6.88
15	9.23	4.02	2.80
16	4.73	12.56	16.82
17	2.65	.24	.76

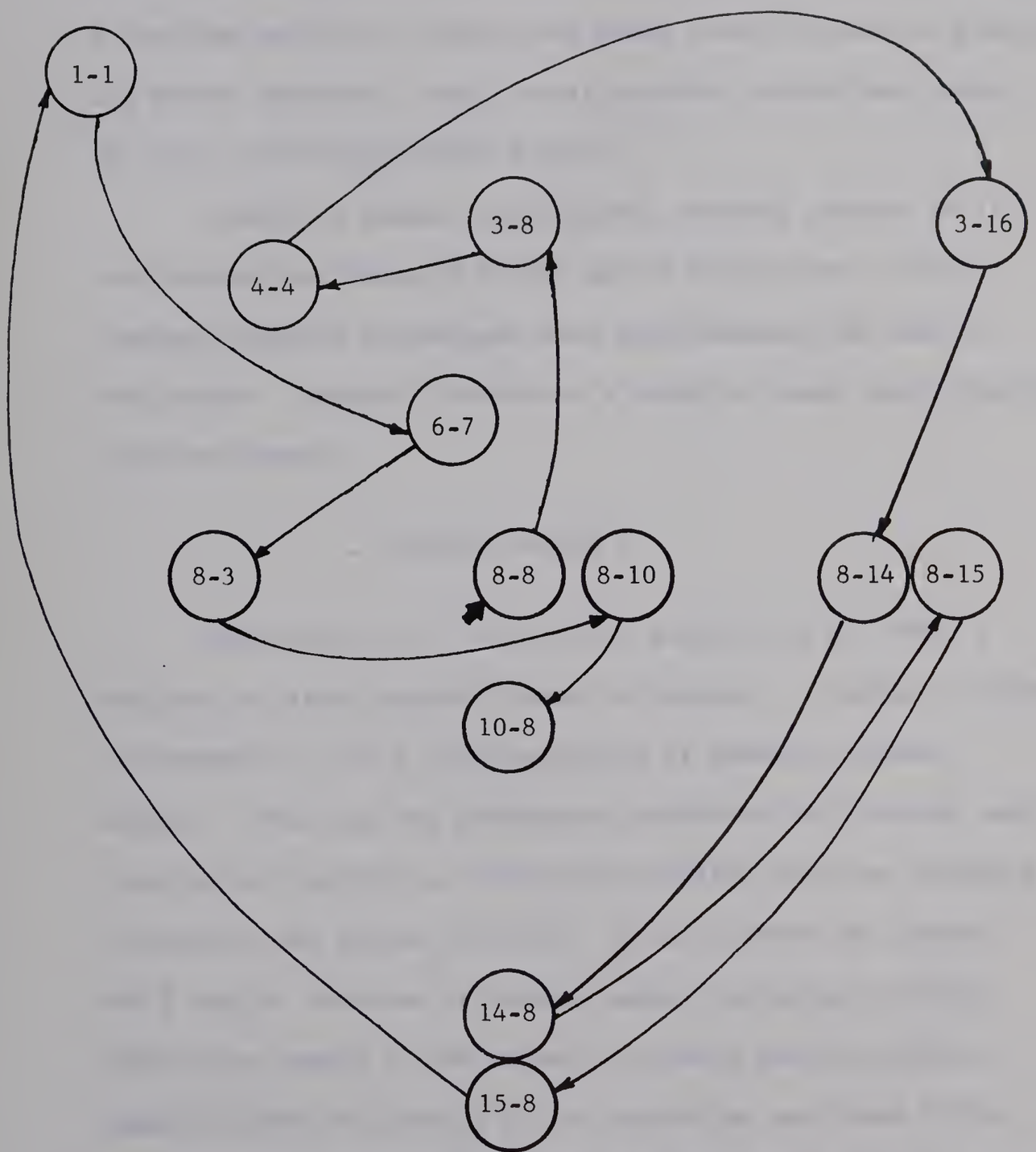
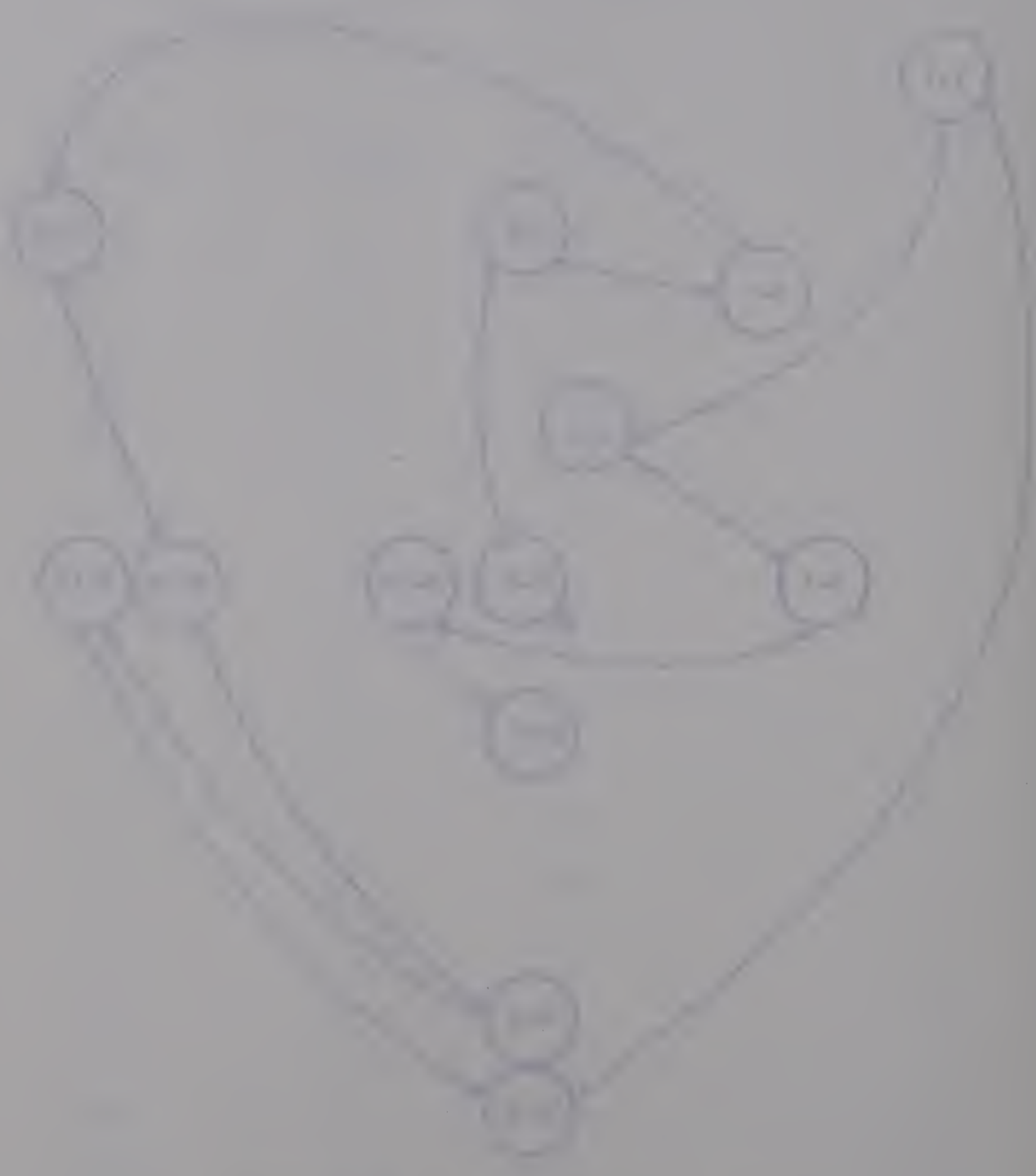


FIGURE 7
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 4



directive which in turn would be followed by a limiting solicitation. Possibly a demonstration would occur which would be followed by a coaching reaction. Structuring would occur followed by question and answer dialogue. Pupils would activily respond and praise for their performance would follow.

Teacher 4 showed a predominant teaching pattern in all the lessons (see Table 12 at the end of Section Two). Each combined category percentages were approximately the same for each lesson. Teacher 4 exhibited a possible common intra-individual teaching behavior.

TEACHER PROFILE 5

Matrices 14, 15, and 16 (See Appendix G) and Table 6 describe the three lessons taught by Teacher 5. Teacher 5 showed the tendency to use a high proportion of command-response behavior. This was the predominant method of solicitation used. Coaching for variety was frequently utilized where as, coaching for quality was seldom utilized. It was observed in Lesson 2 and 3 that an increase of silence and/or confusion occurred. Considering Lesson 3, the amount of silence and/or confusion suggested that the quality of the activities performed by the pupils was low. This was clarified further when Lesson 1 (squares 14-14, 14-15, and 15-15) was compared to the same squares for Lessons 2 and 3. Teacher 5 coached less in Lesson 2 and Lesson 3

TABLE 6

CATEGORY PERCENTAGE SCORES

TEACHER 5- LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	4.82	0.00	0.00
2	0.00	.61	0.00
3	17.34	14.95	10.41
4	3.37	7.68	2.65
5	.32	.61	0.00
6	0.00	1.01	1.06
7	0.00	.61	1.41
8	41.73	47.47	44.44
9	.16	.20	.18
10	2.09	0.00	.88
11	0.00	0.00	0.00
12	.64	1.01	1.94
13	1.61	4.24	.88
14	13.48	4.44	5.29
15	6.58	.40	.53
16	7.06	7.88	10.41
17	.80	8.89	19.93

than in Lesson 1 even though there was a significant increase of activity responses (8-8).

Figure 8 illustrates the possible behavior frequency for Teacher 5. Pupil activity would be followed by a command directive which in turn would be followed by either silence or confusion. Pupils would respond actively after possibly another command directive which could be followed by coaching for variety. Demonstrations and limiting directives would conclude the cycle.

Teacher 5 used Category 5 (free, open directive) solicitation. This proved interesting in that Teacher 5 was the only teacher to use that category. From Table 12 (see Table 12 at the end of Section Two) the combined categories for Teacher 5 varied considerably. This suggested that Teacher 5 did not have a distinct common intra-individual teaching behavior. However, Teacher 5 exhibited some consistentency in the use of command directives.

TEACHER PROFILE 6

Matrices 17, 18, and 19, (See Appendix G) and Table 7 describe the three lessons taught by Teacher 6. For soliciting responses Teacher 6 relied largely on the command-response cycle. However, when explaining tasks the teacher utilized limiting type directives. Teacher 6 did not use a large amount of coaching,

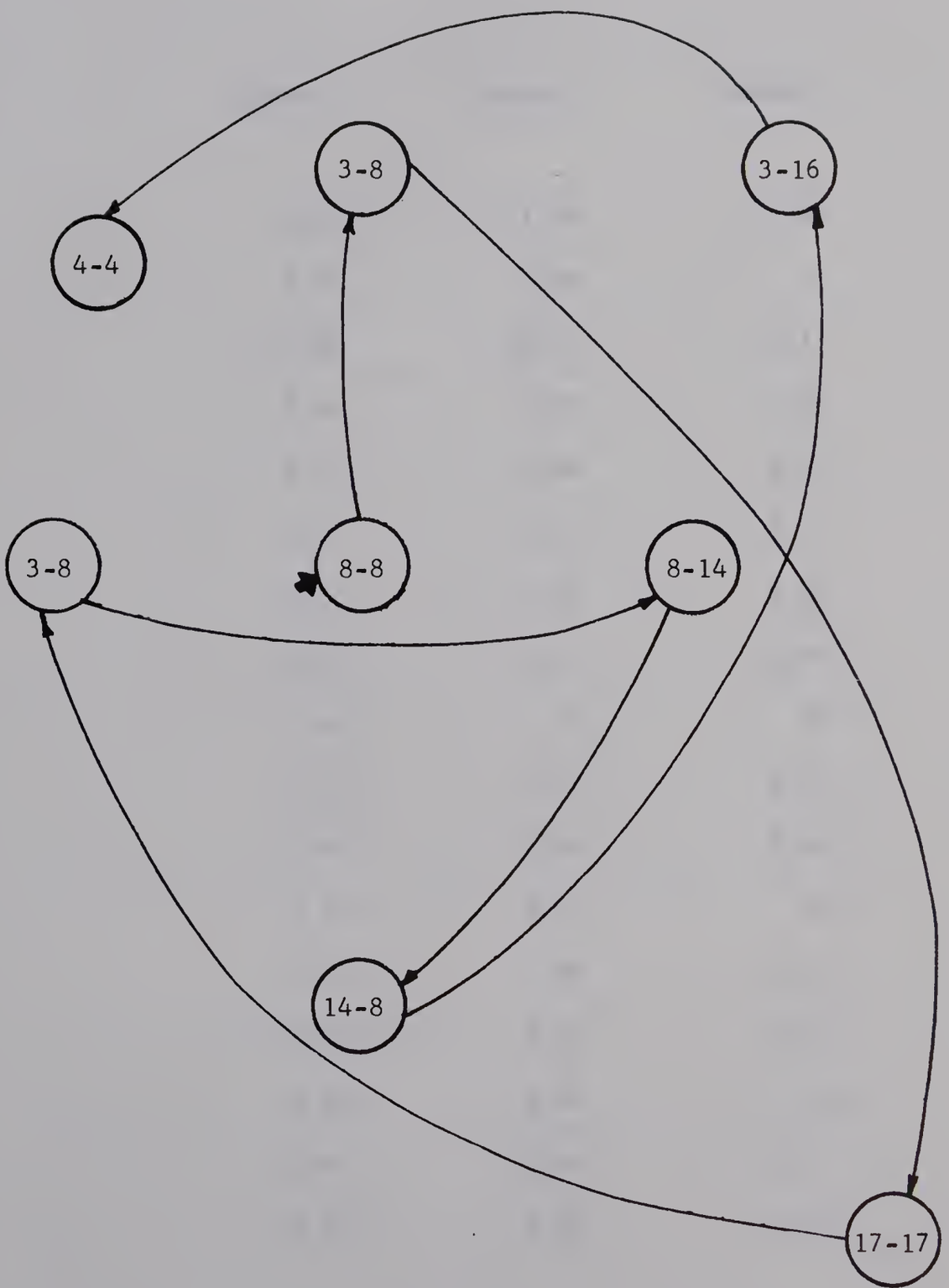


FIGURE 8
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 5

TABLE 7

CATEGORY PERCENTAGE SCORES

TEACHER 6-LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	3.58	13.02	8.09
2	2.04	0.00	.34
3	10.39	10.45	11.13
4	5.96	4.50	4.55
5	0.00	0.00	0.00
6	4.77	2.73	4.23
7	2.56	2.57	4.05
8	38.50	42.12	42.83
9	.68	.16	.84
10	7.16	2.73	4.55
11	0.00	0.00	0.00
12	1.87	1.61	.84
13	2.04	.80	1.35
14	4.94	4.98	3.20
15	6.81	4.82	.84
16	3.07	5.47	9.10
17	5.62	4.02	4.05

but tended to be consistent in praising the pupils' activity performance. The use of demonstrations was apparent in all lessons and a consistent amount of silence and/or confusion was noted. All the lessons showed similar amounts of pupil activity responses.

Figure 9 shows the possible behavior frequency for Teacher 6. Pupil activity would be followed by a command where upon a limiting directive would be introduced. Coaching would follow the solicitation and praise and pupil activity would be present. Structuring would occur and demonstrations would follow. Silence or confusion would occur, which in turn would be followed by question and answer dialogue.

Viewing Table 12 (see Table 12 at the end of Section Two) Teacher 6 used approximately the same amount of soliciting behavior for each of the three lessons. However Teacher 6 used a varied amount of reacting behaviors; a range of 12.0 percent. Teacher 6 tended to exhibit a common intra-individual teaching behavior.

TEACHER PROFILE 7

Matrices 20, 21, and 22, (See Appendix G) and Table 8 describe the three lessons taught by Teacher 7. Teacher 7 showed common intra-individual teaching behaviors for all three lessons. Teacher 7 showed a high proportion of coaching

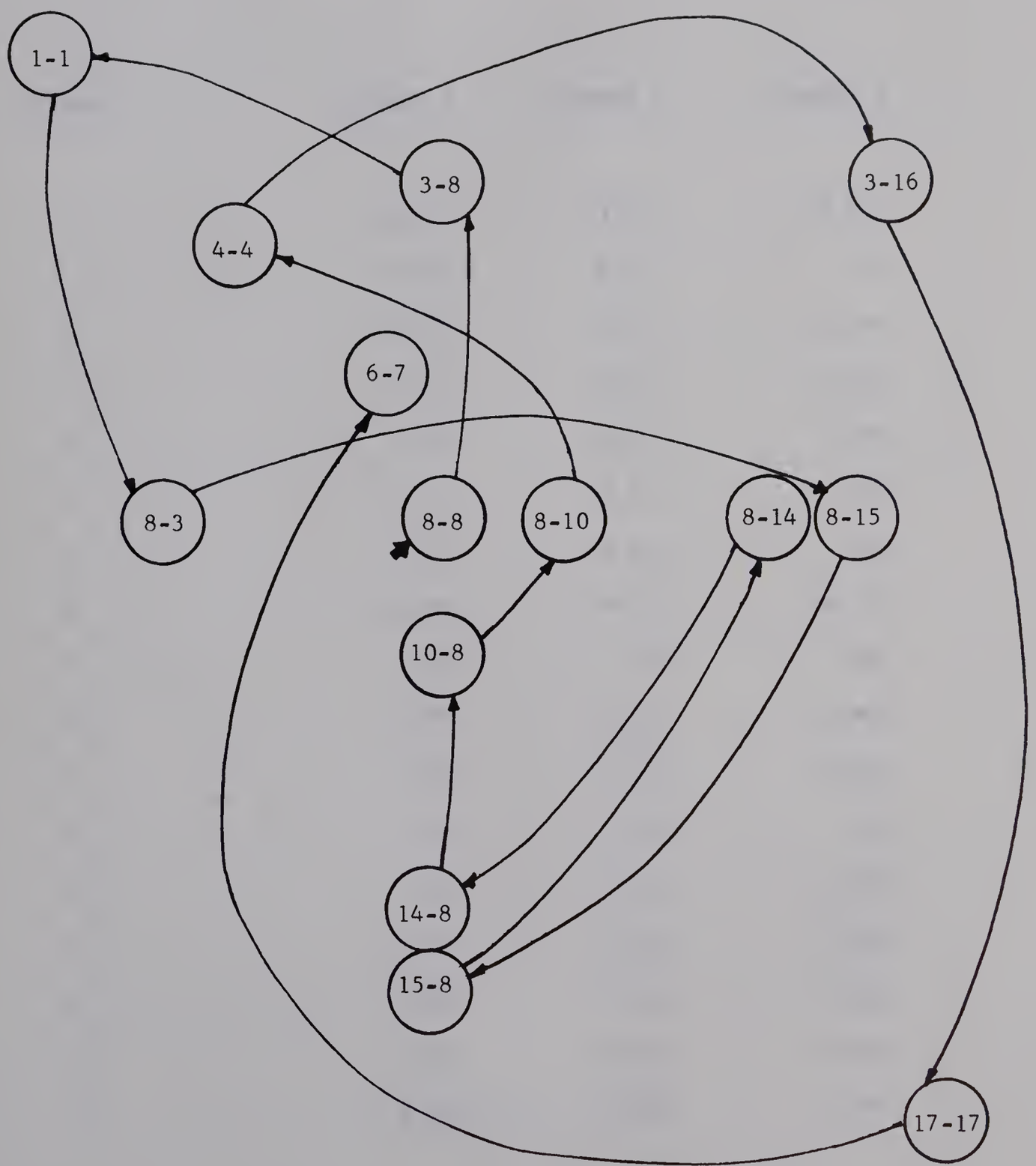


FIGURE 9
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 6

TABLE 8

CATEGORY PERCENTAGE SCORES

TEACHER 7- LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	11.25	13.27	17.01
2	0.00	0.00	.32
3	8.27	5.23	6.26
4	2.85	3.32	3.85
5	0.00	0.00	0.00
6	1.76	2.81	.96
7	.81	1.66	.96
8	42.68	50.00	39.17
9	.41	.26	.80
10	3.93	3.19	3.85
11	0.00	0.00	0.00
12	2.30	1.28	.16
13	.41	1.28	2.57
14	6.37	6.76	6.10
15	13.96	7.02	8.83
16	3.52	1.66	6.90
17	1.49	2.30	2.25

behavior, both for quality and variety. Teacher 7 tended to rely on the command-response cycle of solicitation and used some limiting directive solicitation. The question and answer dialogue cycle fluctuated in each lesson, while silence and/or confusion remained generally the same. With the emphasis on coaching and the amount of praise recorded it was suggested that the children worked well. Demonstrations seemed to be used to emphasize tasks set by the teacher.

Figure 10 shows the possible behavior frequency for Teacher 7. Pupil activity would be followed by physical education type structuring behavior. A command directive would be followed by pupil activity responses which in turn would be followed by coaching for quality and then variety. Praise for the pupils' activity response and discussion utilizing limiting type solicitations would conclude the cycle.

Referring to Table 12 (See Table 12 at the end of Section Two) Teacher 7 showed a definite teaching pattern in that most combined categories percentages were similar for each lesson. Teacher 7 tended to use the same amount of praise for each of the three lessons, as well as approximately an equal amount of criticism.

TEACHER PROFILE 8

Matrices 23, 24, and 25, (See Appendix G) and Table 9 describe the three lessons taught by Teacher 8. Teacher 8 used

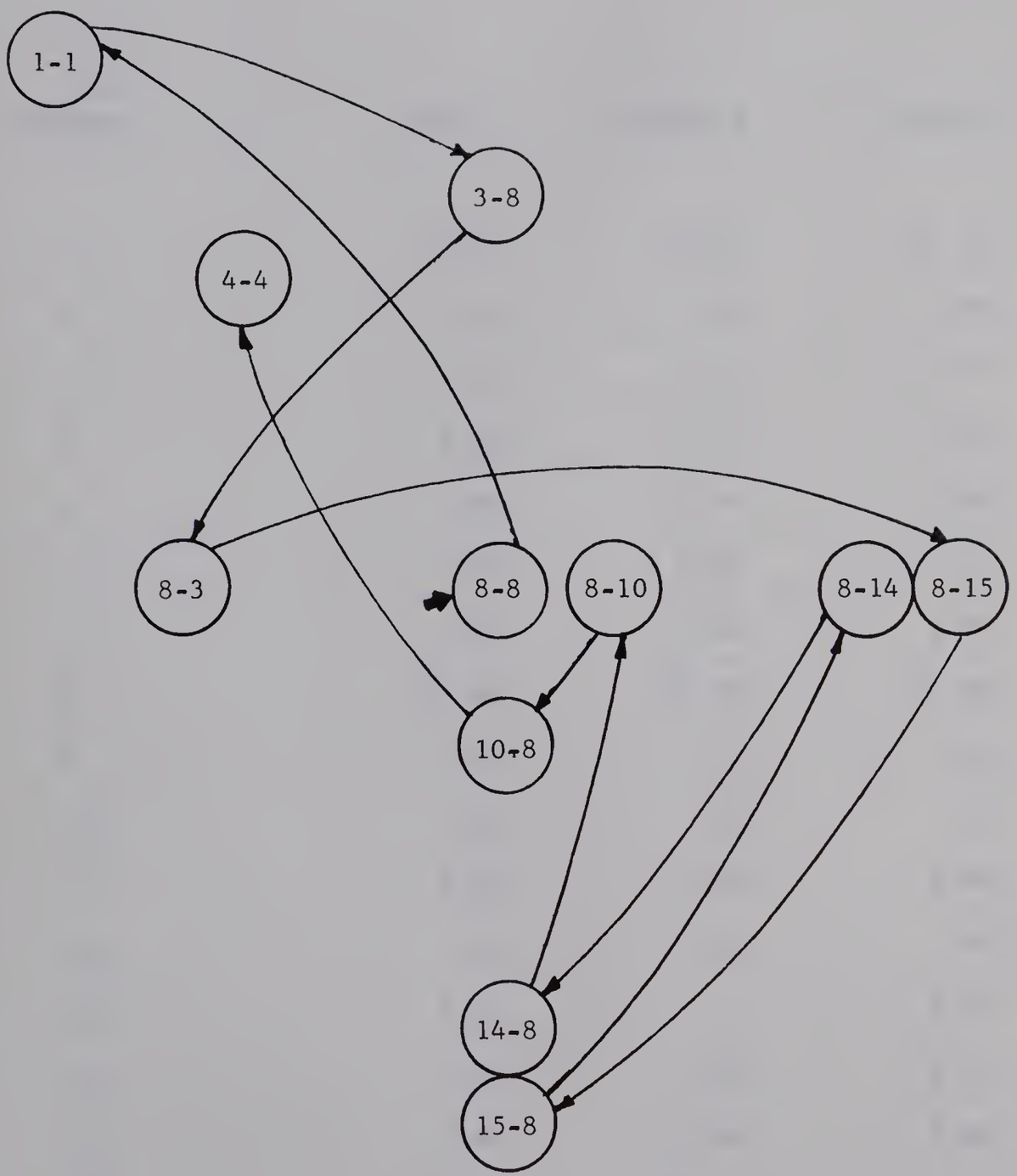


FIGURE 10
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 7

TABLE 9

CATEGORY PERCENTAGE SCORES

TEACHER 8- LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	19.28	37.66	32.34
2	1.24	.18	0.00
3	7.31	7.46	8.32
4	5.60	1.78	9.26
5	0.00	0.00	0.00
6	2.95	1.60	1.73
7	2.49	2.31	1.56
8	28.46	40.68	24.96
9	1.24	.71	.16
10	1.56	.71	.62
11	0.00	0.00	0.00
12	.93	1.95	.94
13	1.56	.71	1.73
14	2.18	3.02	6.12
15	2.49	2.84	1.88
16	7.15	10.12	9.58
17	3.11	2.31	1.73

a high proportion of physical education type structuring behavior in all three lessons. It was noted that more continued structuring (1-1) took place than did continued pupil activity (8-8). Teacher 8 utilized the command-response cycle throughout each lesson and did not coach to any large extent. Demonstrations were used in Lesson 1 and Lesson 3. Silence and/or confusion remained consistent after the first lesson. The question and answer dialogue was also consistent, while the amount of praise varied from lesson to lesson.

Figure 11 illustrates the possible behavior frequency for Teacher 8. Structuring physical education type behaviors would occur first. These would be followed by pupil activity which would in turn be followed by a command directive. A limiting solicitation would continue the cycle and would be followed by pupil responses to the solicitation. Some coaching and possibly a demonstration would end the cycle.

Teacher 8 exhibited a common intra-individual teaching behavior. The tendency to use structuring type behaviors and to be consistent in the combined categories of praise and criticism suggested a pattern of behavior common to that teacher (See Table 12 at the end of Section Two). The combined categories of pupil response showed variation from lesson to lesson.

TEACHER PROFILE 9

Matrices 26, 27, and 28, (See Appendix G) and Table 10

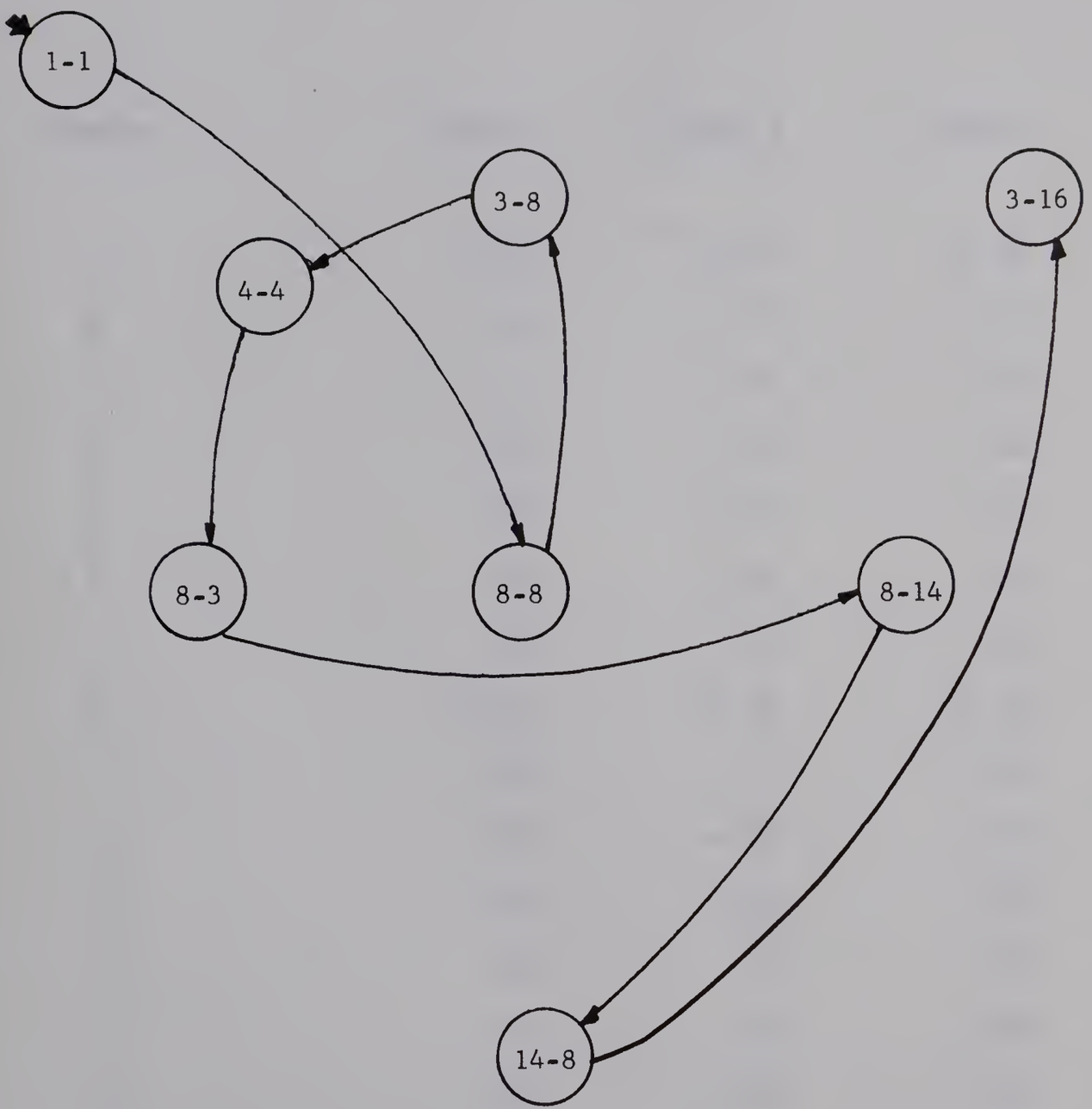


FIGURE 11
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 8

TABLE 10

CATEGORY PERCENTAGE SCORES

TEACHER 9- LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	11.43	12.79	15.20
2	0.00	0.00	0.00
3	7.35	9.06	9.50
4	3.67	7.10	3.56
5	0.00	0.00	0.00
6	.61	1.24	1.90
7	.20	.71	1.43
8	55.10	47.78	47.74
9	0.00	.53	0.00
10	3.67	4.09	2.61
11	0.00	0.00	0.00
12	.41	.18	1.19
13	0.00	.36	0.00
14	8.16	7.10	5.46
15	6.12	4.09	1.19
16	3.27	4.44	9.74
17	0.00	.53	.48

describe the three lessons taught by Teacher 9. Teacher 9 showed consistent teaching behavior throughout all three lessons. There was a noticeable lack of silence and/or confusion in all the lessons which suggested that the teacher was well prepared and that the pupils were challenged by the tasks set. Teacher 9 utilized the command-response cycle to make solicitations and tended to coach for variety rather than quality. The number of demonstrations remained fairly constant however, the amount of time taken to demonstrate increased in Lessons 2 and 3. There was little question and answer dialogue, but a significant amount of praise.

Figure 12 shows the possible behavior frequency for Teacher 9. Pupil activity would be followed by physical education type structuring behavior which in turn would be followed by a command directive. Pupils would respond actively to the command where upon coaching would be introduced. A limiting directive would be followed by a demonstration which in turn would be followed by praise.

Teacher 9 tended to be consistent in most of the combined categories (see Table 12 at the end of Section Two). This suggested that Teacher 9 exhibited a common intra-individual teaching behavior.

TEACHER PROFILE 10

Matrices 29, 30, and 31, (See Appendix G) and Table 11 describe the three lessons taught by Teacher 10. Teacher 10

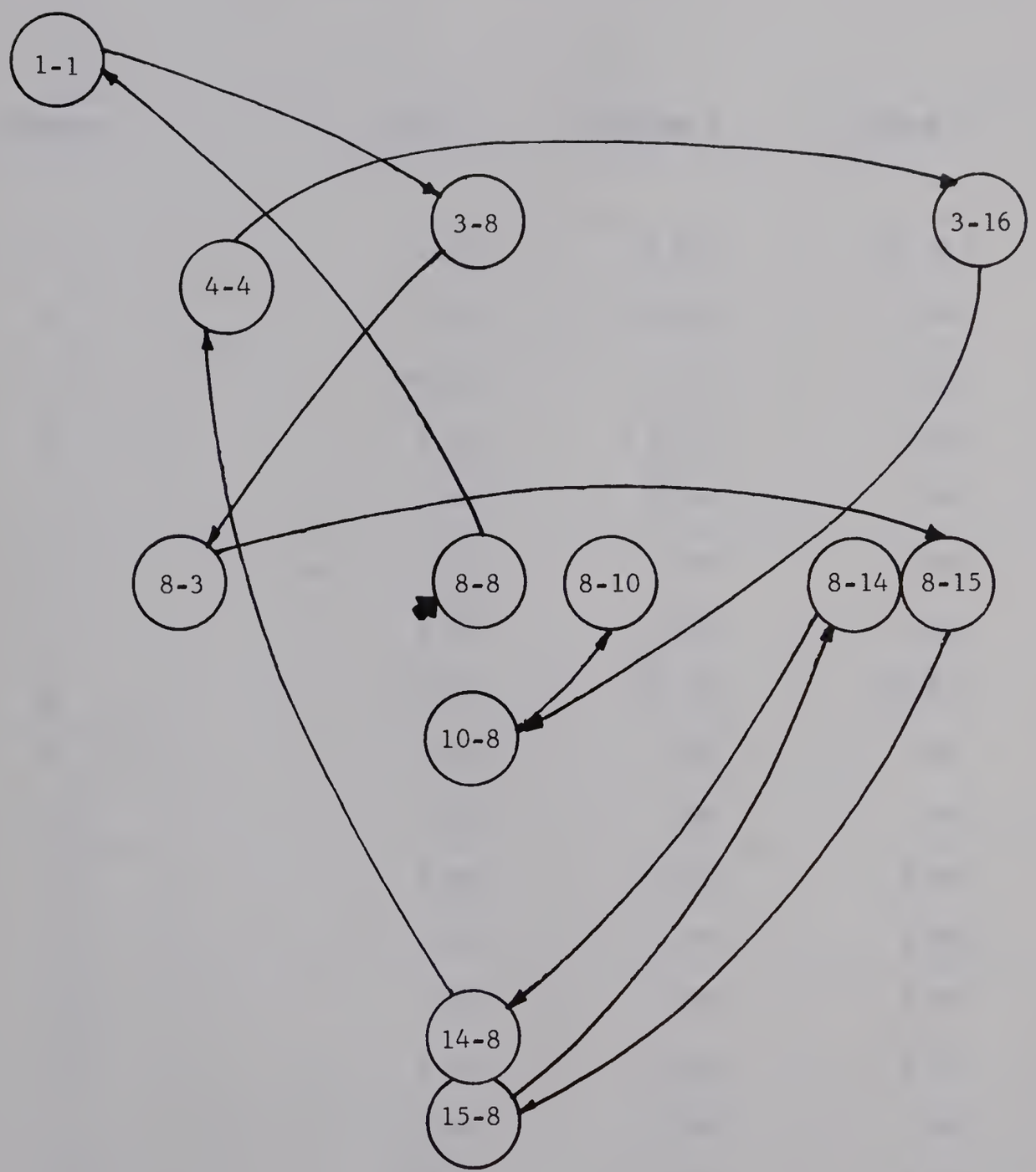


FIGURE 12
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 9

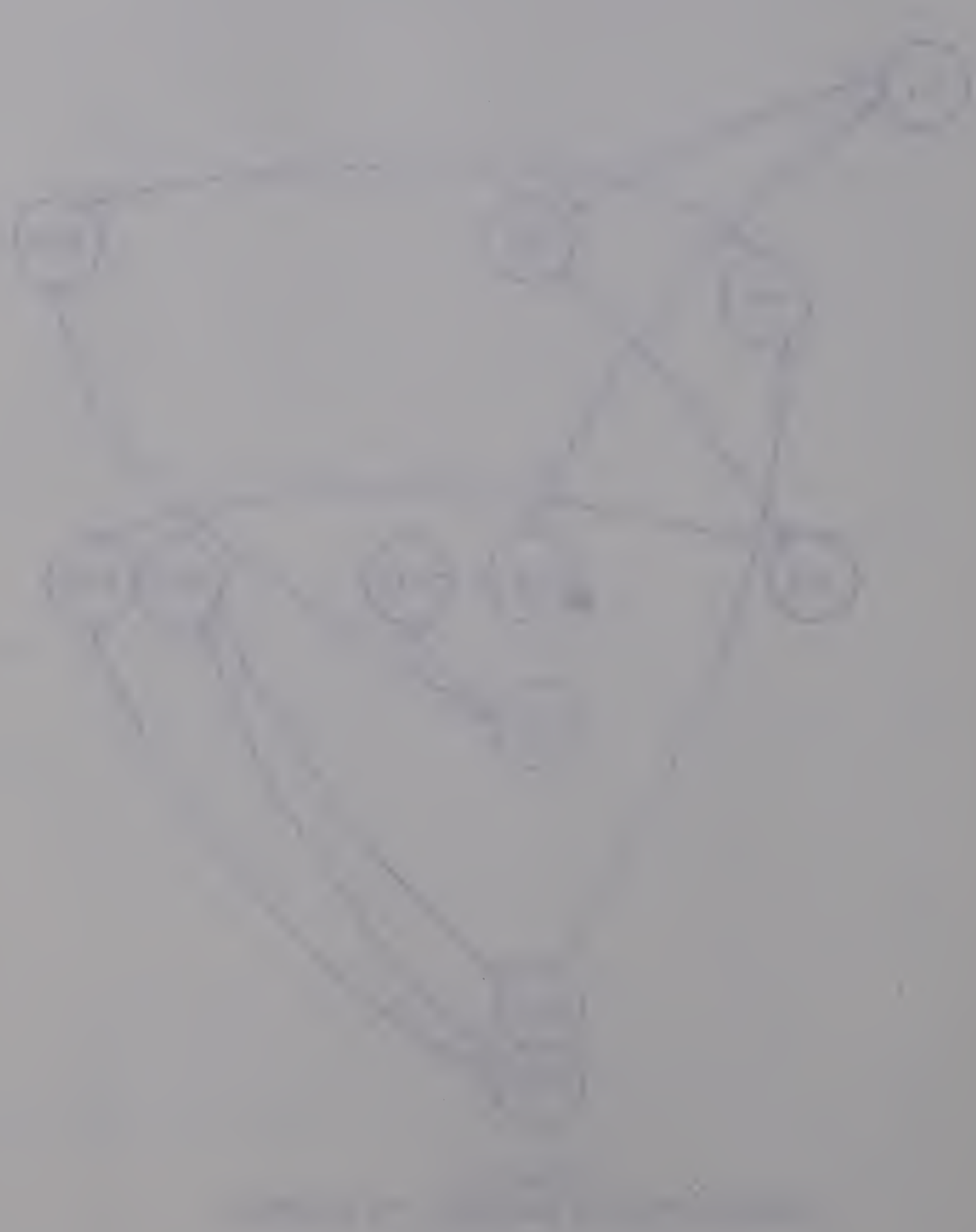


TABLE 11

CATEGORY PERCENTAGE SCORES

TEACHER 10-LESSONS, 1,2,3

CATEGORY	LESSON 1	LESSON 2	LESSON 3
1	1.11	2.59	11.01
2	0.00	0.00	0.00
3	10.15	7.97	7.52
4	4.45	6.97	5.10
5	0.00	0.00	0.00
6	5.01	1.39	4.56
7	2.23	3.78	4.16
8	43.67	53.19	50.87
9	0.00	.20	.81
10	2.23	.80	.54
11	0.00	0.00	0.00
12	0.00	0.00	0.00
13	0.00	0.00	0.00
14	8.07	8.76	5.37
15	9.04	1.60	.94
16	10.15	7.97	7.11
17	3.89	4.78	2.01

did not utilize any reacting behaviors for correcting or rejecting either pupil performance or pupil behavior. This suggested that the children worked well and did not create discipline problems. Teacher 10 relied on the command-response cycle for solicitation purposes and used limiting directives for explaining tasks. Teacher 10 coached for variety and quality and showed a tendency to coach for variety more in the last two lessons. Question and answer dialogue was noticeable in all three lessons, while praise for the activity performance was lacking. Teacher 10 allowed many demonstrations in all three lessons. These demonstrations provided enrichment for the tasks presented throughout the lessons.

Figure 13 shows the possible behavior frequency for Teacher 10. Pupil activity would be followed by a command directive which in turn, would be followed by coaching, a possible demonstration, structuring behavior and a response from the pupils. Limiting directives would occur next in the cycle where upon a demonstration and/or a question and answer sequence would occur.

Teacher 10 tended to show a consistent use of soliciting behaviors for each lesson and did not use criticism or non-physical education behaviors throughout the three lessons (see Table 12 at the end of Section Two). Teacher 10 exhibited a common intra-individual teaching behavior.

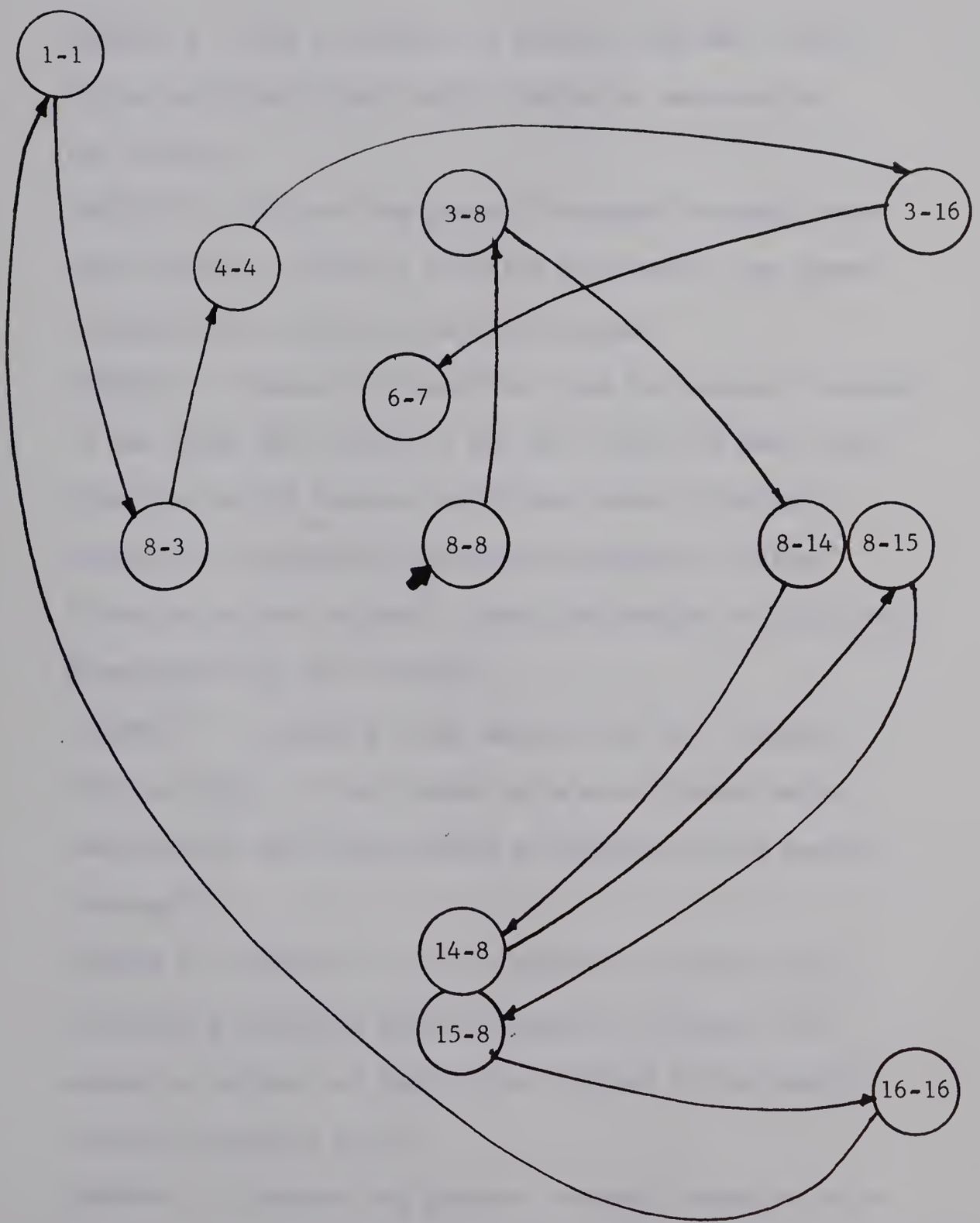


FIGURE 13
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 10

INDIVIDUAL TEACHING BEHAVIORS AND THE GENERAL "AVERAGE" TEACHING BEHAVIOR

TEACHER 1 - tend to follow the general "average" behavior cycle, but more silence and/or confusion was noted in the lessons.

TEACHER 2 - followed the general "average" behavior cycle very closely. Teacher 2 utilized the question and answer dialogue cycle more so than the "average".

TEACHER 3 - tended to praise more than the general "average". It was noted that Teacher 3 did not utilize as many demonstrations in the lessons as did the general "average".

TEACHER 4 - structured less than the general "average". It was noted that Teacher 4 used more command and limiting directives than the "average".

TEACHER 5 - deviated a large amount from the "average" behavior cycle. There tended to be more silence and/or confusion in the three lessons as compared to the general "average".

TEACHER 6 - tended to use less physical education type structuring behaviors than the general "average", but seemed to include all the cycles utilized in the general "average" behavior cycle.

TEACHER 7 - followed the general "average" behavior cycle quite closely. However, Teacher 7 tended to coach and praise pupil performance more frequently than the "average".

TEACHER 8 - deviated from the "average" behavior cycle as he tended to structure more frequently than the general "average".

TEACHER 9 - teaching behavior molded very closely with the general "average" teaching behavior.

TEACHER 10 - displayed a teaching behavior similar to the general "average", however, less structuring behaviors were evident.

SUMMARY OF SECTION TWO

It is apparent from the data presented that elementary school physical education grade five gymnastics can be taught in various ways. From each of the ten teacher profiles consistencies among the teachers were evident. All the teachers utilized the command-response cycle frequently. All teachers, to various degrees, incorporated demonstrations in their lessons. Generally, all the teachers exhibited their own, personal, intra-individual teaching behavior. It was noted however, that some teacher's teaching behavior was more prevalent than others.

TEACHERS	1			2			3			4			5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1 & 2 STRUCTURING	10.1	15.1 12.5	12.3	7.0	12.6 12.6	18.3	4.4	6.6 4.8	3.5	4.5	4.0 6.0	9.6	4.8	.6 1.8	.0
3-4-5 SOLICIT	11.9	7.4 11.1	14.1	15.6	16.1 13.3	8.3	10.2	12.0 11.4	12.1	14.1	17.2 15.1	14.1	21.0	23.2 19.1	13.1
10-11 PRAISE	2.7	1.1 1.8	1.6	1.9	2.0 2.7	4.2	11.7	5.9 8.4	7.7	3.7	4.9 4.26	4.2	2.1	.0 1.0	.9
12-13 CRITICISM	4.3	3.1 4.5	6.1	4.1	3.9 3.6	2.8	3.0	2.8 2.1	.4	2.7	1.7 2.3	2.4	1.3	5.3 3.1	2.8
2-11-13 NON-PE	3.4	2.6 3.8	5.3	1.9	5.1 3.1	2.4	2.6	2.2 1.9	.9	1.0	1.1 1.3	1.8	1.6	4.9 2.5	.9
14-15 COACHING	19.3	12.4 14.7	12.4	9.9	9.6 10.5	12.1	16.5	7.6 12.4	13.2	16.5	12.1 12.8	9.7	20.1	4.8 10.2	5.8
10-15 REACTION	26.2	16.6 20.9	20.1	15.9	15.4 16.8	19.2	31.2	16.3 20.4	13.6	22.9	18.7 19.3	16.3	24.4	10.1 14.7	9.5
7-8-9 RESPONSE	43.1	49.0 44.83	42.4	47.8	47.3 47.13	46.3	44.2	56.4 50.53	51.0	49.4	40.7 42.9	38.7	41.9	48.3 45.4	46.0

TABLE 8

PERCENTAGE OF COMBINED CATEGORIES PER LESSON PER TEACHER

TEACHERS	6			7			8			9			10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1 & 2 STRUCTURING	5.6	13.0 9.0	8.4	11.3	13.3 14.0	17.3	20.5	37.8 30.2	32.3	11.4	12.8 13.13	15.2	1.1	2.6 4.9	11.0
3-4-5 SOLICIT	16.4	15.0 15.7	15.7	11.1	8.6 9.9	10.1	12.9	9.2 13.2	17.6	11.0	16.2 13.4	13.1	14.6	14.9 14.0	12.6
10-11 PRAISE	7.2	2.7 4.8	4.6	3.9	3.2 3.7	3.9	1.6	.7 1.0	.6	3.7	4.1 3.5	2.6	2.2	.8 1.2	.5
12-13 CRITICISM	3.9	2.4 2.8	2.2	2.7	2.6 2.6	2.7	2.5	2.7 2.6	2.7	.4	.5 .7	1.2	.0	.0 0	.0
2-11-13 NON-PE	4.1	.8 2.2	1.7	.4	1.3 1.5	2.9	2.8	.9 1.8	1.7	.0	.4 .1	.0	.0	.0 0	.0
14-15 COACHING	11.8	9.8 8.5	4.0	20.3	13.8 16.3	14.9	4.7	5.9 6.2	8.0	14.3	11.2 10.7	6.7	17.1	10.4 11.26	6.3
10-15 REACTION	22.8	14.9 16.2	10.8	27.0	19.5 22.7	21.5	8.7	9.2 9.7	11.3	18.4	15.8 14.90	10.5	19.3	11.2 12.5	6.9
7-8-9 RESPONSE	41.7	44.9 44.8	47.7	43.9	51.9 45.6	40.9	32.2	43.7 34.2	26.7	55.3	49.0 51.16	49.2	45.9	57.2 53.0	55.8

TABLE 12 (continued)

PERCENTAGE OF COMBINED CATEGORIES PER LESSON PER TEACHER

SECTION THREE - INTER-INDIVIDUAL TEACHING BEAHVIORS

The average percentage per category per teacher, as illustrated in Table 13, allows the comparison of the average percentage of tallies in each category for each teacher or the comparison of categories among the other teachers in the sample. Again, it must be stressed, that no value judgements are implied.

It was observed from Table 13 that different teachers utilized different percentages of tallies for each category. Teacher 8 showed 29.8 percent of the tallies for Category 1 where as Teacher 5 showed 1.6 percent of the total tallies for the same category. This difference may be due to the amount of time spent during each lesson for getting out and putting away gymnastic equipment. To further clarify these differences, Teacher 5 used gymnastic equipment for one lesson while Teacher 8 utilized such equipment for all three lessons.

Category 2 (non-physical education type structuring behavior) showed virtually no large variation, however, Teacher 9 and 10 did not use this structuring behavior.

Teacher 5 showed 14.2 percent of the total tallies for Category 3 (command, authoritarian directive) as compared to 5.0 percent for Teacher 3. This suggested that Teacher 5 tended to be authoritarian in comparison and exhibited 74 percent of her solicitations to exercise complete control over the pupil's responses.

TABLE 13

AVERAGE PERCENTAGE PER CATEGORY PER TEACHER

	T	E	A	C	H	E	R	S		
CATEGORY	1	2	3	4	5	6	7	8	9	10
1	11.9	12.0	4.6	5.7	1.6	8.2	13.8	29.8	13.1	4.9
2	.5	.6	.2	.4	.2	.8	.1	.5	0.0	0.0
3	7.3	8.8	5.0	9.4	14.2	10.7	6.6	7.7	8.6	8.6
4	2.8	4.5	6.5	5.9	4.6	5.0	3.3	5.6	4.8	5.5
5	0.0	0.0	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0
6.	2.0	3.1	3.5	4.0	.7	3.9	1.8	2.1	1.3	3.7
7	2.2	3.8	2.9	4.0	0.0	3.1	1.1	2.1	.8	3.4
8	41.3	42.6	46.5	38.2	44.6	41.2	44.0	31.4	50.2	49.2
9	1.4	.7	1.1	.8	.2	.6	.5	.7	.2	.3
10	1.8	2.7	8.4	4.3	1.0	4.8	3.7	1.0	3.5	1.2
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	1.2	1.1	.4	1.3	1.2	1.4	1.3	1.3	.6	0.0
13	3.3	2.5	1.7	.9	2.2	1.4	1.4	1.3	.1	0.0
14	6.6	5.0	6.4	7.4	7.7	4.4	6.4	3.8	6.9	7.4
15	8.1	5.6	6.1	5.4	2.5	4.2	9.9	2.4	3.8	3.9
16	3.5	5.0	4.1	11.4	8.5	5.9	4.0	9.0	5.8	8.4
17	4.9	2.0	2.7	1.2	9.9	4.6	2.0	2.4	.3	3.6
TOTAL TALLIES	1876	1961	2366	2472	1685	1802	2145	1843	1474	1966

The teachers, with the exception of Teacher 1 and Teacher 7, utilized similar amounts of restrictive or limiting directives (Category 4). Teacher 5 was the only teacher in the sample to use Category 5 (open, free directives).

Teacher 5 showed .7 percent of the total tallies for Category 6 (interjecting directives) as compared to Teacher 4 who showed 4.0 percent of the total tallies for the same category. This suggested that Teacher 4 used a questioning method of solicitation to a greater degree.

Category 10 (confirming performance reaction) was used by all ten teachers. Teacher 3 showed the most use with 8.4 percent of the total tallies being recorded. Teacher 8 and Teacher 5 showed little use of this category. Their average percentages for that category were 1.0 percent and 1.0 percent respectively.

The teachers with the exception of Teachers 3, 9, and 10 used Category 12 (correcting performance) in approximately the same amounts. Correcting behavior (Category 13) was used by nine of the ten teachers in the sample. Teacher 10 did not use Category 13.

Of all the ten teachers who utilized Category 14 (extending performance reaction), Teacher 5 used that category the most (7.7 percent), Teacher 8 used that category the least (3.8 percent).

All ten teachers used Category 15 (focussing performance

reaction). Teacher 7 showed 9.9 percent of the total tallies as compared to 2.4 percent of the total tallies for Teacher 8. It was suggested by Teacher 8's percentages for Categories 14 and 15 that little "coaching" occurred during each of the three lessons.

Teacher 4 noticeably used a great number of demonstrations as expressed by 11.4 percent of the total tallies for Category 16 (demonstrations).

Considering the average percentage for Category 17 (silence and/or confusion), Teacher 5 showed 9.9 percent which was 6.5 percent above the average for that category. Teacher 9 who showed .3 percent for Category 17 was calculated to be 3.3 percent below the average. It was difficult to distinguish whether silence represented the majority of these percentages or if confusion represented most of the described percentages.

SUMMARY OF SECTION THREE

Referring to the data presented in Section Three, it was noted that no distinct common inter-individual teaching behavior existed between or among the ten teachers in the sample. Each teacher tended to structure, solicit, and react in his or her own particular manner. This suggested that teachers generally tend to adapt to a particular pattern, develop their lessons around that pattern and teach each lesson in that manner. Each pattern is unique to that individual.

CRITIQUE OF THE INSTRUMENT TO ANALYZE TEACHER BEHAVIOR IN ELEMENTARY SCHOOL PHYSICAL EDUCATION

BACKGROUND

The instrument to analyze teacher behavior in elementary school physical education was developed by Robbins (1973). The instrument was divided into five sections: 1. Teacher Structuring, 2. Teacher Solicitation, 3. Pupils' Response, 4. Teacher Reaction, and 5. Other. Each section contained unique behavior categories. Teacher Structuring was represented by physical education centered structuring type behavior and non-physical education behavior. Section 2, Teacher Solicitation was represented by command, authoritarian directive, limiting directive, free or open directive and teacher questioning. The third section of the instrument which focussed on Pupil's Response was represented by pupils' verbal response, pupils' activity response and pupils' initating response. The fourth section, Teacher Reaction contained confirming performance reaction, confirming behavior reaction, correcting performance reaction, correcting behavior reaction, extending reaction, focussing reaction, and demonstrations. The last section of the instrument contained one behavior category, silence and/or confusion. A detailed description of each of the five sections and seventeen categories was provided in Chapter Three of this study.

To use the instrument an observer must first learn the sections and categories of the instrument; secondly, categorize lesson transcripts; thirdly, categorize videotaped lessons; and fourthly, categorize live lessons. After such training, the observer would be tested for objectivity. If a Scott's Coefficient of .80 or above is recorded for the trainee it is assumed that the individual's objectivity is acceptable and the trained observer is able to conduct observations.

IMPLICATIONS FROM THE STUDY

The study to examine "Teaching Behaviors of Grade Five Gymnastic Teachers"provided a clearer insight into the instrument's ability to describe what teaching behaviors occur in gymnasia. It was discovered by the researcher that the instrument generally described adequately what went on in elementary physical education gymnastics.

Robbins (1973) in the development of his instrument classified teacher behaviors into three main sections; structuring, soliciting and reacting behaviors. Pupil behavior was categorized as response behaviors and on "other"category accounted for silence or confusion. The present author encountered some difficulty in totally accepting the assigning of certain of Robbins' categories to Bellacks' pedagogical moves.

CATEGORY 6 - TEACHER QUESTIONING - Robbins included this category under the general section of teacher solicitation. In practice it was found that teachers used questions in structuring soliciting behaviors and also as a reaction to the pupils' responses. Robbins suggests that in order to examine the teacher's questioning behavior more fully, subscripting of the category would be useful. In the present study, therefore, category 6 is not included when calculating percentage scores for combined categories of Teacher Solicitation.

CATEGORY 16 - DEMONSTRATION - Another difficulty was observed by the researcher regarding Category 16 (Demonstration). In practice, the demonstrations were found to be performed by both the teacher and/or the students. Because of this, it was difficult to distinguish whether such demonstrations were actually solicitations or reactions by the teacher or responses from students. Although Robbins included Category 16 under Teacher Reaction the present researcher was unable to include this category when calculating percentage scores for the combined categories of Teacher Reaction.

CATEGORY 17 - SILENCE OR CONFUSION - The researcher in reporting the results of the study found it difficult to differentiate beteen silence and confusion which occurred in a lesson. This was due to the fact that

both behaviors were represented by only Category 17. Consequently, the amounts of silence and/or confusion were unable to be precisely reported.

Some indication of the type of behavior may be assumed from the sequence of events. For example, if a 17 (silence or confusion) is followed by a 13 (criticism) it could be assumed that the recorded 17 signified confusion which the teacher corrected. In order to develop a workable number of categories, some behaviors must be treated collectively and therefore some information will be last. If the instrument is to be used in the field, the ensuing discussion with the observed teacher will clarify the type of behavior. But if the instrument is to be used as a research tool, Category 17 may conceal some useful information. The problems encountered in using the Robbins' Instrument are useful when combining categories in order to explore such an area as total teacher solicitation, but do not detract from the usefulness of the instrument especially as a tool for use in the field.

IMPLICATION REGARDING DATA INTERPRETATION

The data that is obtained from using the instrument can be displayed in various ways. It is important, when describing teaching patterns for instance, that an explanation of "Behavior Frequency" and "Behavior Events" is provided.

"Behavior Frequency" is described as the number of times a behavior is observed in relation to other behaviors. "Behavior Events" is described as the order of behaviors which are observed in relationship to other behaviors.

Both "Behavior Frequency" and "Behavior Events" can easily be displayed in flow chart form. It is interesting to note, that both may provide different descriptions of teaching behaviors.

Behavior Frequency - provides a picture of the behaviors most likely exhibited by a teacher (a teacher may tend to use a large amount of structuring for example). In explanation, the cell with the greater number of tallies is considered as the behavior most likely to occur most often. The cell with the next highest number of tallies is considered as the behavior most likely ot occur next. This is continued for all significant teacher behaviors. See Figures 14 and 15 for Behavior Frequency Flow Charts.

The value of "Behavior Frequency" data is that a description of the dominate teaching behaviors of a teacher are provided. In comparing each teachers "Behavior Frequency", most teachers would tend to have different or no common inter-individual teaching behaviors.

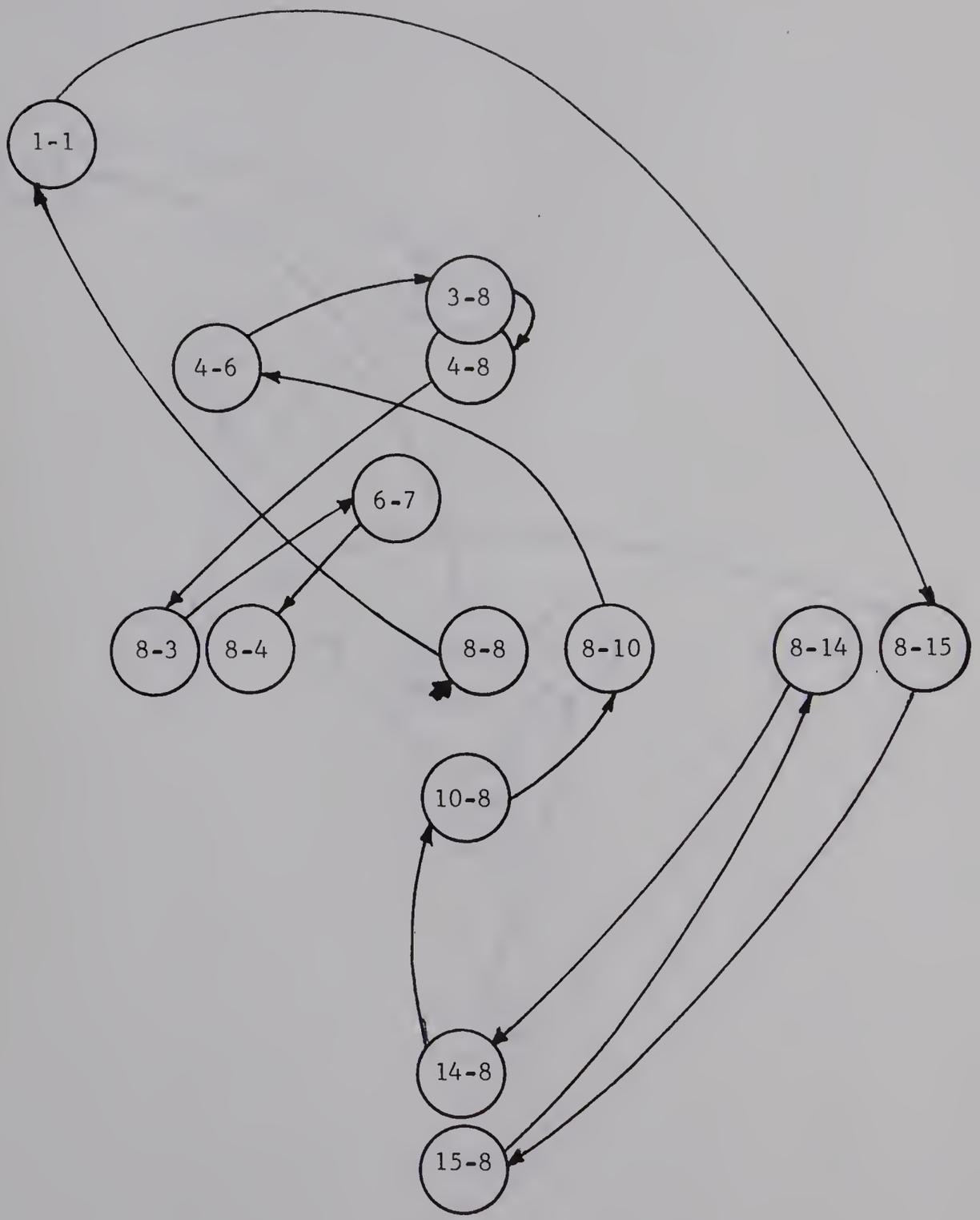


FIGURE 14
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 3

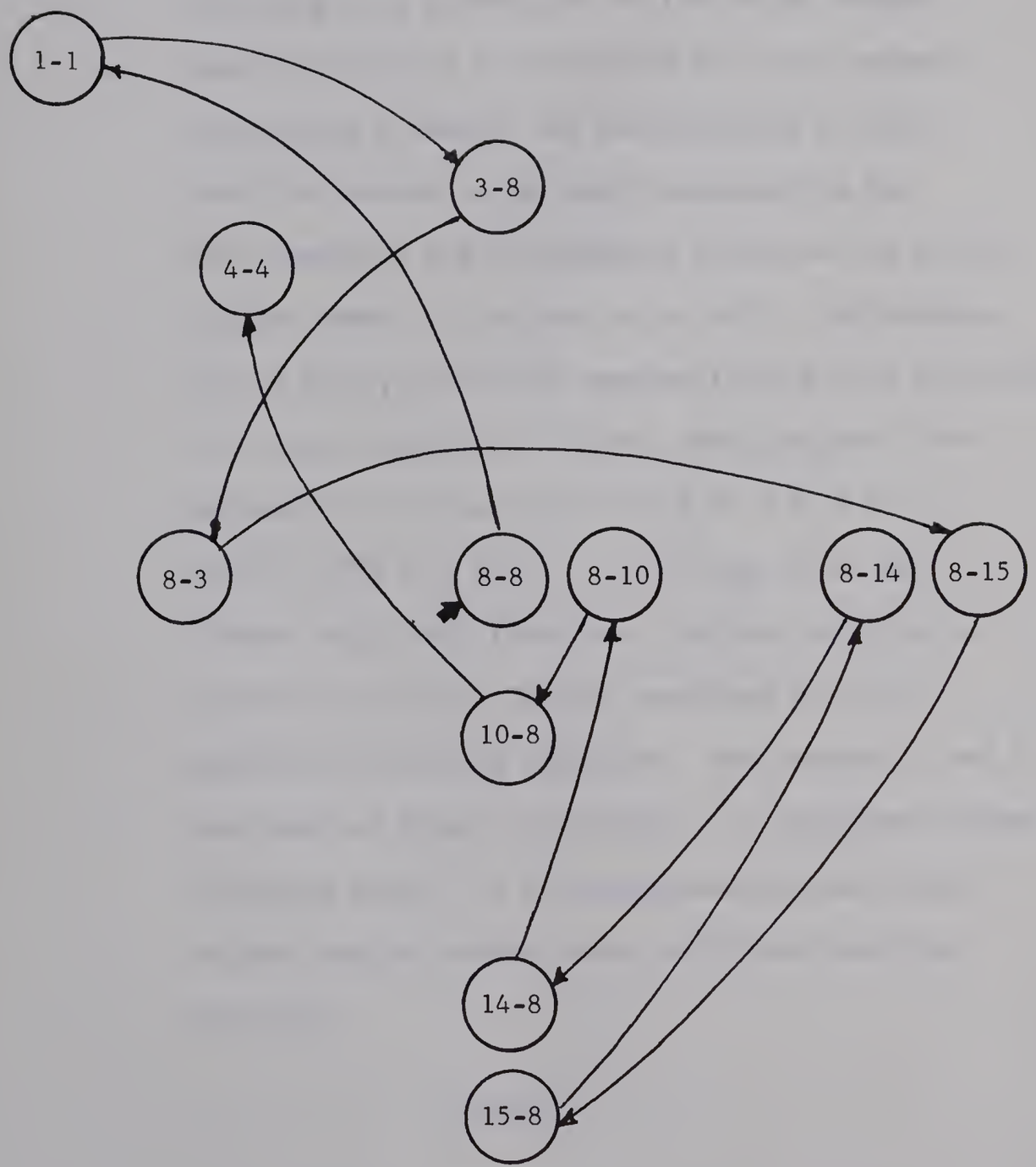


FIGURE 15
POSSIBLE BEHAVIOR FREQUENCY FOR TEACHER 7

Behavior Events - provides a picture of the behavior which occur successively during a lesson. Referring to a matrix, the cell with the largest number of tallies is considered the first behavior observed in a lesson. The next behavior to occur would be located in the cell incorporating the first behavior and the behavior which has the second largest number of tallies in its cell. For example, cell 8-8 (pupil activity response) may be the cell with the largest number of tallies, therefore, the first behavior to be observed. Cell 1-8, 2-8, 3-8,... 17-8 or cell 8-1, 8-3, ..., 8-17 may be the next largest tally cell therefore, the next behavior to succeed the first. This is contained for all significant teaching behaviors. See Figures 15 and 16 for Behavior Events Flow Charts. In comparing teachers "Behavior Events" in this study, teachers would tend to have similar common inter-individual teaching behaviors.

SUMMARY

This chapter has provided a detailed analysis of the data collected for the study. The chapter was sectioned into three parts in order to clearly identify whether or not; common

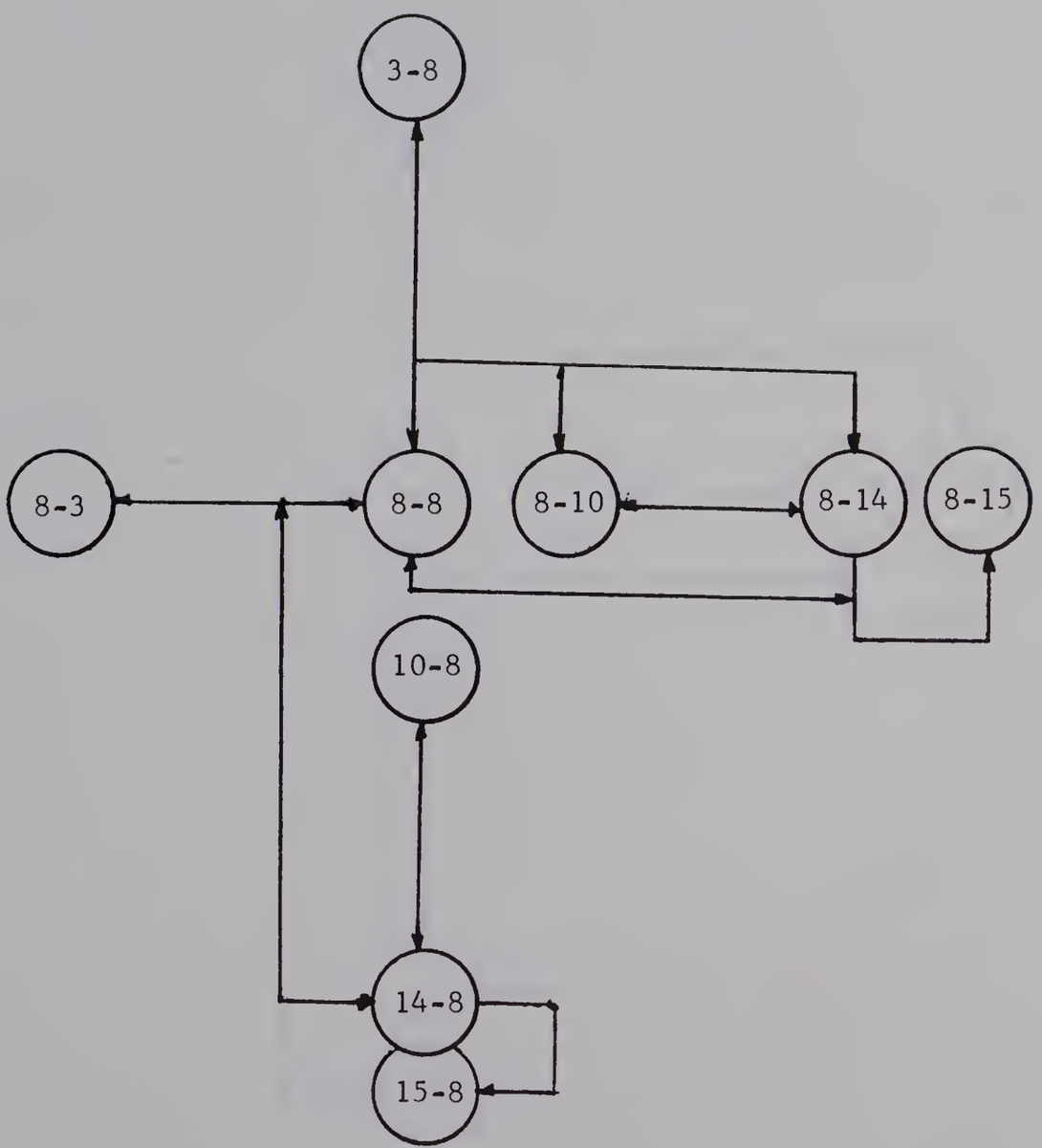
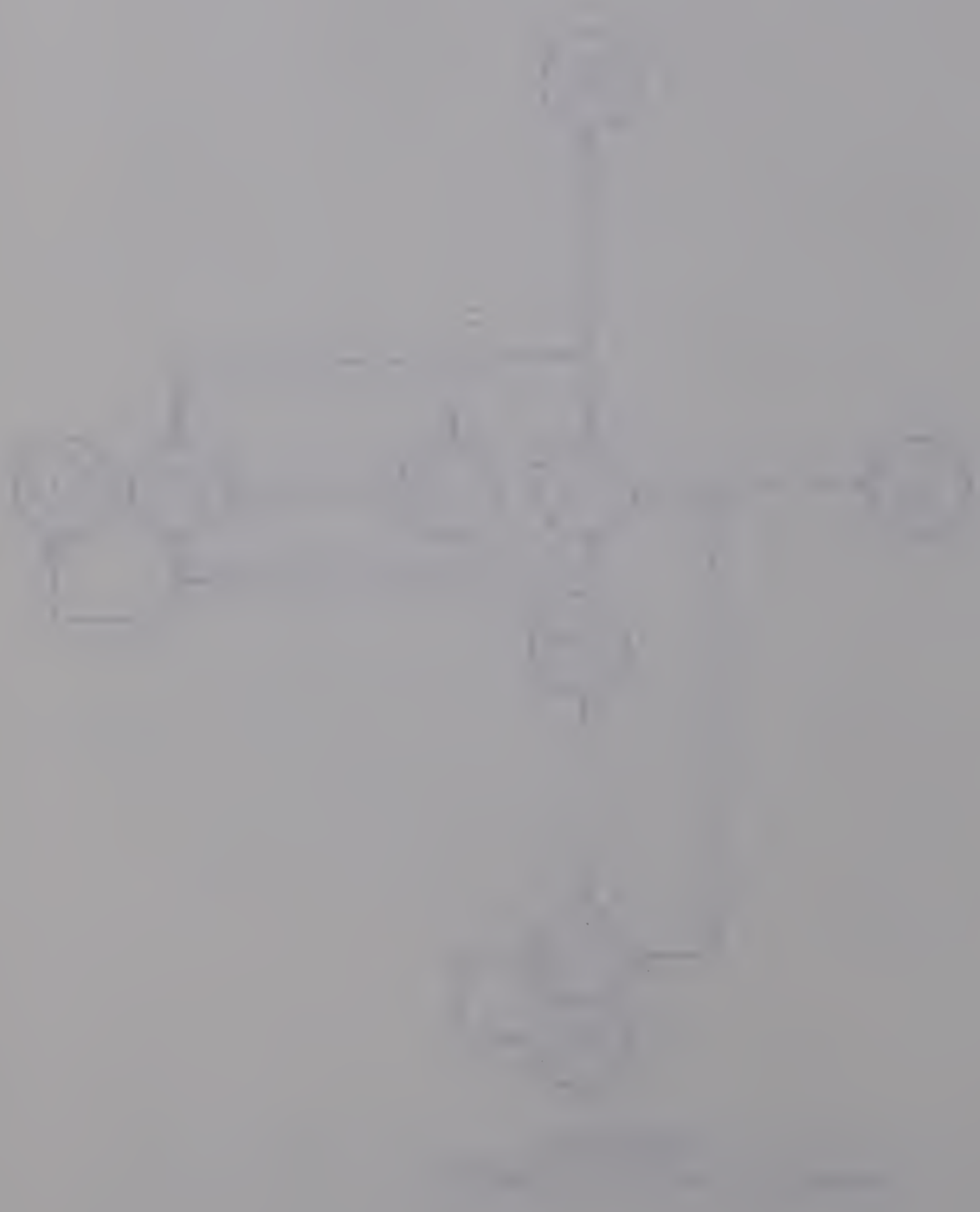


FIGURE 16
BEHAVIOR EVENTS FOR TEACHER 3



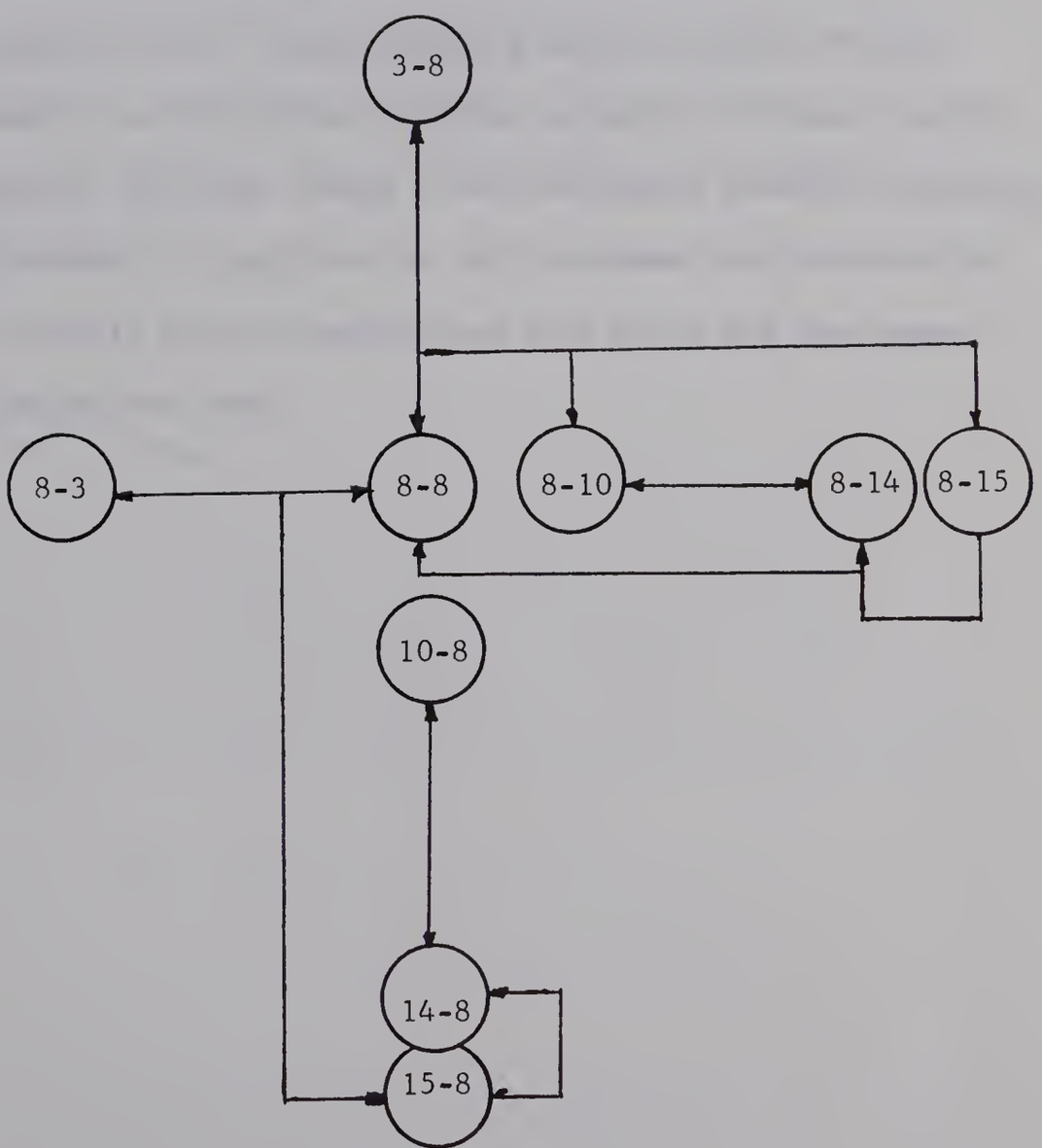


FIGURE 17
BEHAVIOR EVENTS FOR TEACHER 7

teaching behaviors in elementary school physical education grade five gymnastic existed; common intra-individual teaching behaviors existed, and whether or not common inter-individual teaching behaviors existed.

Reflecting back to each section in Chapter Four, it was suggested that common teaching behaviors were evident, that common intra-individual teaching behaviors for each teacher were apparent, and that common inter-individual teaching behaviors were not evident. A critique of the instrument was provided in order to clarify factors encountered when using the instrument and displaying the data.

CHAPTER 5

SUMMARY, CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

INTRODUCTION

It is the purpose of this chapter to summarize briefly the significant details of the study. Also included are the conclusions resulting from the investigation and suggestions for further research.

SUMMARY

The purpose of this study was to examine teaching behaviors of teachers of grade five gymnastics in order to identify teacher behaviors in that situation. The data obtained from the thirty observations carried out during this study provided the imput with which to analyze the possibility of:

1. Identifying common teaching behaviors in elementary physical education grade five gymnastics.
2. Identifying, if any, intra-individual commonalities in teaching behaviors.

and

3. Identifying, if any, inter-individual commonalities in teaching behaviors.

Robbins' (1973) instrument for analyzing teacher behavior in elementary school physical education was chosen

as the most suitable instrument for describing the interaction occurring in school gymnasia. The observer was objectively trained to use the instrument and coded the observed lessons utilizing a tape recorder and a three second superimposed signal.

The data were transposed to vertical tally lists where upon the codes were paired and the total tallies per category were calculated. The consecutive paired codes more sequencially place on matrices thus providing profiles of each lesson of the ten teachers' behaviors and a composite matrix for all teachers. The total tallies per category supplied percentages with which comparisons of teacher behaviors were made.

Analyzing the data in these forms provided a clearer insight into what occurred in elementary physical education grade five gymnastic lessons. It was anticipated that together with existing research, stronger base for preparing prospective teachers in the field of elementary physical education may be provided.

CONCLUSIONS

The results of the study as reported in Chapter Four, showed precisely what types of interaction occurred. It was apparent from the findings that each teacher taught in unique manner. Though no common inter-individual behaviors dominated

(Behavior Frquency) the results suggested that for all ten teachers, some behaviors tended to be more prevelant (common) than others. This was exemplified in one instance where the teachers tended to use soliciting behaviors more than structuring behaviors. The matrix, which showed the combined thirty lessons of the ten teachers, presented an average picture of how teachers generally would conduct a gymnastics lesson(s). Although that composite matrix provided insight into the common teaching behaviors in elementary physical education grade five gymnastics only two teachers from the sample closely resembled that average picture (Behavior Frequency).

It was noted that various extremes of teaching behaviors were revealed. Also each particular teacher taught in his or her unique fashion. One teacher used a large amount of structuring behavior, where as another used very little. One teacher tended to have a large amount of silence and/or confusion in the lessons where as another teacher had very little. Similarly, one teacher tended to coach often, while another teacher did not coach to any large extent.

Though all teachers instructed the same gymnastic themes, it was apparent that the same material could be taught in various ways. The results suggested that common intra-individual behaviors were prevalent from lesson to lesson however, common inter-individual behaviors did not dominate and thus it was

difficult to suggest that any such common teaching behaviors between or among teachers definitely existed. It may be postulated that the School Boards providing unit lesson plans with strict procedures that must be followed by all teachers teaching gymnastics will be fruitless. It may further be suggested, that teacher-proof lesson material is virtually impossible to develop.

Demonstrations were incorporated into all thirty lessons. Whether the teacher, a child or a group of children performed an activity for the rest of the class, it was suggested from the data obtained that teachers perceive demonstrations as a possible form an integral part of teaching grade five gymnastics.

It is difficult to reproduce precisely the actual lessons in matrix or behaviorcycle form. It is evident, however, that such information would be extremely useful and in context, if the teachers being analyzed by the instrument acquired immediate feedback.

It is difficult to conclude at this point that definite teaching styles exist. This does not suggest that styles of teaching are not prevalent. The teachers under investigation did exhibit consistencies which occurred from lesson to lesson. However, it is necessary to point out that a larger number of lessons taught by the ten teachers would have to be observed before any significant conclusion could be reached regarding the existence of teaching styles in the teaching of grade five

gymnastics.

At present, a potential benefit which this type of interaction analysis provides, is to assist teachers in understanding how they are teaching physical education. The instrument does not show what is good teaching or what is bad teaching - it passes no judgements. That type of evaluation is imposed only by the observer and the observed.

SUGGESTIONS FOR FURTHER RESEARCH

The main purpose of this study was to examine teaching behaviors of elementary teachers of grade five gymnastics. Certain specific questions arise from this investigation that are worthy of further study.

1. Would teacher behavior change from the beginning to the end of a school year?
2. Does the teaching behavior occurring in one area of elementary school physical education change in another elementary school physical education area?
3. Does the teaching behavior of a teacher alter from grade to grade in elementary schools?
4. Is there a teaching behavior which would prove to be the most effective in teaching elementary school physical education?

5. Does a teaching behavior change during the teaching of a gymnastics unit?
6. Does the availability of gymnastics equipment alter a teaching style?
7. Does the element of competition affect a teacher's teaching behavior?
8. Could a program designed to instruct teachers in analyzing their teaching behavior in elementary school physical education prove beneficial?
9. What are the results of pupil performance and various teaching behaviors?
10. Is one style of teaching elementary school physical education superior to another?

SUMMARY

This chapter has provided a brief summary of the study, conclusions resulting from the investigation and suggestions for further research. The conclusions suggested that common teaching behaviors and common intra-individual teaching behaviors do exist. It was also concluded, that common inter-individual teaching behaviors were not evident through Behavior Frequency display. The questions which were sighted for further research provide future researchers with challenging problems of worthwhile significance.

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APPENDIX "A"

AN EXAMPLE OF CODING INTERACTION WHICH MAY OCCUR IN AN ELEMENTARY PHYSICAL EDUCATION GYMNASTIC LESSON

TRANSCRIPT 1

TEACHER: Hello children. How are you this morning? Before we start I would like to remind you that tomorrow your parents can come to the school. Please remind them. Run and stop on the signal. Go!

CHILDREN: (Activity Response) (running)

TEACHER: Stop! --pause-- Go!

CHILDREN: (Activity Response)

TEACHER: Stop! Go!

CHILDREN: (Activity Response)

TEACHER: Stop! Show changes in direction this time.

CHILDREN: (Activity Response)

TEACHER: Good, well done!

CHILDREN: (Activity Response)

TEACHER: Try to run more quietly!

CHILDREN: (Activity Response)

TEACHER: Stop! Find a partner. --pause-- One of you put up your hand. --pause-- You are number 1 the other is number 2. Number 1 chase number 2. Go!

CHILDREN: (Activity Response)

TEACHER: Use changed of direction and stops and starts. Stop! Get a ball and throw and catch the ball in two's!

CHILDREN: (Activity Response)

TEACHER: Stop! Look this way. Throw and catch the ball while you are moving.

APPENDIX "B"

OBSERVER TRAINING MANUAL

Robbins (1973) in developing an instrument to analyze teacher behavior in elementary school physical education designed a comprehensive training manual for observers using the instrument. He recommended that the prospective observer:

1. Learn the sections - Structuring, Soliciting, Responding, Reacting, and Other.
2. Learn the seventeen categories.
3. Categorize transcripts of lessons and review.
4. Categorize transcripts and video taped lessons.
5. Categorize live observations.

The manual may be easily located in Robbins (1973) Doctoral Thesis entitled "The Development of an Instrument to Analyze Teacher Behavior in Elementary School Physical Education".

APPENDIX "C"

DESCRIPTION AND CALCULATIONS OF SCOTT'S COEFFICIENT

In this study the Scott's coefficient technique as described by Flanders (1966) was used to acquire observer objectivity.

Scott calls his coefficient 'pi' and it is determined by two formulae below:

$$II = \frac{Po - Pe}{100 - Pe} \qquad (1)$$

Po is the percentage of agreement, and Pe is the percentage of agreement expected by chance which is found by squaring the proportion of tallies in each category, summing these over all the categories, and multiplying by 100.

$$Pe = 100 \sum_{i=1}^{k} pi^2 \qquad (2)$$

In formula two there are k categories and pi is the proportion of tallies falling into each category. II in formula one, can be expressed in words as the amount that two observers exceeded chance agreement divided by the amount that perfect agreement exceeds chance. (Flanders, 1966, p. 13).

CALCULATIONS OF SCOTT'S COEFFICIENT FOR

VIDEO TAPED LESSON

$$II = \frac{(100 - 13.04) - 28.29}{100 - 28.29}$$

$$I = .81$$

CALCULATIONS OF SCOTT'S COEFFICIENT FOR

OBSERVED LESSON

$$II = \frac{(100 - 3.4) - 17.06}{100 - 17.06}$$

$$II = .95$$

APPENDIX "D"

RESEARCH APPROVAL

MONTON PUBLIC SCHOOLS
107A Avenue Edmonton Alberta T5H 0Z8 Telephone (403) 429-5621

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Associate Superintendent
Mr. G. P. Nicholson
Associate Superintendent

February 21, 1974

Mr. W. A. Kiffiak
Administrative Assistant
Division of Field Experiences
University of Alberta
EDMONTON, Alberta

Dear Mr. Kiffiak

Re: RESEARCH REQUEST - G. N. Pickard (S. G. Robbins)

The above project has been approved on a permissive basis following examination by our department and consultation with Miss M. Irwin, Assistant Supervisor, Physical Education.

Arrangements have been made to conduct the study with the principals and teachers in the schools concerned at the times indicated in the attached memo from Marion Irwin.

I would appreciate receiving a copy of the results of the study as soon as they are available.

Sincerely

Tom Blowers, Ph.D.
Director of Research
Research & Evaluation

TAB/ks
c.c. Mr. S. G. Robbins
Mr. G. N. Pickard
Miss M. Irwin
Mr. A. Youngberg
Mr. M. Mazeppa
Mr. M. Pedde
Mr. G. Traynor
Mr. J. Hunter
Mr. W. Fisher

APPENDIX "E"

COMMUNICATIONS TO TEACHERS AND PRINCIPALS

FACULTY OF PHYSICAL EDUCATION
THE UNIVERSITY OF ALBERTA
EDMONTON 7, ALBERTA, CANADA

DEPARTMENT OF EDUCATIONAL SERVICES

A DESCRIPTIVE STUDY CONCERNING TEACHER BEHAVIORS IN ELEMENTARY PHYSICAL EDUCATION

The purpose of this study is to examine teaching behaviors of elementary teachers in grade five gymnastics in order to identify common teacher behaviors in this situation. The identification of predominant behaviors may suggest that unique teacher styles exist in the teaching of elementary physical education grade five gymnastics.

Dr. S.G. Robbins, Associate Professor at the University of Alberta researching in the area of elementary physical education, has developed an instrument for analyzing teacher behavior in physical education. His instrument requires the use of an observer to categorically code verbal and non-verbal responses of teachers and pupils. The observer utilizes a tape recorder to code the verbal or non-verbal responses for each teacher during three different gymnastics lessons.

It is not the intent of this study to suggest that one particular style of teaching is superior to another teaching style. On the contrary, the researcher seeks to identify common behaviors occurring in elementary grade five gymnastics classes. Through this research a contribution toward discovering and understanding common teacher behaviors and styles may be made, thus adding to the limited knowledge in this area.

Garth Pickard
1974

Dear

I would like to thank you for your cooperation with regard to the research I am conducting in the area of Teacher Behavior in Elementary Physical Education. Because little research has been carried out in this field, I am sure the findings will prove most interesting and valuable. Included in this letter is information relating the teachers and schools involved, the observation times for each teacher, and the general Gymnastics Themes to be used for each consecutive lesson.

GYMNASTIC THEMES

LESSON 1 .....BODY SHAPES - (Stretching and curling)

stretching - body is (or parts of the body) completely extended

curling - body is (or parts of the body) completely flexed

LESSON 2 ..... LOCOMOTION - (sudden and sustained)

sudden - movement which is fast or quick

sustained - movement which is slow or not quick

LESSON 3 ..... SPACE - (general or personal space)

general - the body is allowed to travel anywhere in the environment

personal - the body is allowed to move in the space it occupies

If any more information is required or if unforseen difficulties arise (sickness etc.) please feel free to contact me at 432-3837 (Dept. of Educational Services) or at 476-8393 (residence).

Thank you.

April 10th, 1974

Dear

I would again like to extend my thanks for the time and effort you spent in helping me complete my research. I feel it was most rewarding and significant. Results of the study will be available by the end of April and I will contact you in order to explain the findings.

Thank you again.

Sincerely,

Garth Pickard

GP/cc

APPENDIX "F"

GYMNASTIC THEME DESCRIPTION

The aims in teaching gymnastic in elementary school are described by Mauldon and Layson (1966) as:

1. To develop efficiency and a skilled use of the body in practical situations when working alone and with others, on the floor and on apparatus.
2. To stimulate an understanding and appreciation of objective movement coupled with an ability to invent and select appropriate actions. (pg. xii)

The term gymnastics, as emphasized in the Alberta Physical Education Curriculum Guide, 1969, refers to that portion of the physical education program to the development of basic movement skills which are fundamental to the performance of any activity. Emphasis is placed upon the development of movement concepts and understandings and the applications of these to a variety of practical situations. The children are encouraged to observe and analyze in order to understand movement. Themes are developed relative to the effort factor which is concerned with weight and time; the space factor which is concered with direction, level, pathway, and body shape; the flow factor which is concerned with the degree of body control.

It is with the above understood that the three gymnastic themes were chosen.

It is necessary to comment that even though a gymnastic theme should be taught over a period of consecutive lessons, this approach was considered inappropriate for the study. In clarification, even though this method was considered by many experts in the field as the proper way of teaching gymnastics, few teachers instruct in this way. Also, few teachers have a strong background in movement education making it difficult for them to follow the prefered form.

GYMNASTIC THEME 1

BODY SHAPE - This term refers to the shape the body makes whkle either travelling or in stillness. This gymnastic theme allows children to become aware of their different body parts with respect to where that body shape is, how that body shape moves and with whom that body shape relates too.

For purposes of the first lesson body shape dealing specifically with curling and stretching was utilized.

GYMNASTIC THEME 2

LOCOMOTION - This term refers to travelling, that is, the transference of weight from one part of the body to another in succession. This theme allows children to become aware of the possible ways of travelling. It encourages changes in speed (sudden and sustained), allows movement on hands, feet, and other

body parts, and provides children with the awareness of space.

GYMNASTIC THEME 3

SPACE - Space as a gymnastic theme incorporates many other basic themes. It is mainly concerned with the pathways the body moves in, the direction the body moves in, the levels the body utilizes, and the shape the body is in. These factors provide the basis for the general space which allows the body to travel anywhere in the environment, and personal space which allows the body to move in the space it occupies.

It was felt that all teachers in the Sample would either understand the themes provided or that they could easily procure related information.

APPENDIX "G"

MATRICES

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C	1	1922	3	103	29	1	24		21	11	2		7	9	9	4		19
	2	4	30	8	1		1		11	4	1				1	3		1
A	3			6	9		1	2	1131	1	1			2	1	1	468	3
	4	6		104	609		8		187		2		2	8	39	7		1
T	5					2			3									
	6	5	3	67	3		32	386	9	2	1		4	4	7	3	1	
E	7	20	4	92	23		132	93	40	5	18			12	31	28	4	
	8	119	8	780	177		146	1	490	73	463		96	74	740	751	1	173
G	9	16	19	22	3		4		10	9	7		2		4	11	1	2
	10	2		26	13		14		589		22				9	16	17	1
O	11																	
	12	6		25	5		3		73	2	2		27	7	11	4	3	6
R	13	19		35	14		17		39				6	99	1	2	2	23
	14	5		87	24		22		737	2	6		2	3	301	34	22	2
Y	15	3		45	9	4	16		771	2	21		1	7	25	120	20	
	16	11		157	24		86	1	11	4	96		7	11	65	58	675	7
	17	21	6	80	22		15	1	37	4	5		6	36	7	1		421

MATRIX 1

A MATRIX TO SHOW THE COMBINED THIRTY LESSONS OF THE TEN TEACHERS

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C	1	71	1	1					2				1	1				4
	2		1						1	1								
A	3									33							16	
	4			3	10					3				1		1		
T	5																	
	6			2			1	4						1	2			
E	7				1		2	1	1	1								
	8	3		20	3			1	115	7	8		5	1	30	55		9
G	9	1	1	1			1		1		2					1		
	10			1					15									
O	11																	
	12			3	1								1	2	3			
R	13	1		5	1				1					13				1
	14			5			1		30	1					10	4		
Y	15			5	1		2		52		3				3	5		
	16			4			2		1		1				4	4	12	
	17	4		1			2		1					3				25

MATRIX 2

A MATRIX TO SHOW TEACHER 1's LESSON 1

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	99		4					2									1
C	2		1						2								7	
	3								30					1				
A	4			2	32				3				1					
	5																	
T	6							17	1		1				2			
	7	1		3			4	10	3				1	1	1	5		
E	8	4	2	14	1		11		229	6	6			7	23	28		10
	9	1		1			1			1	1				1	2		
G	10								8							1		
	11																	
O	12			2					1				2		1			
	13			2			1		5					3		2		3
R	14			3	1				26						9		1	
	15				1				35	1				3	1	7		
Y	16			1							1				2		19	
	17	2		4	3		2		1					3				24

MATRIX 3

A MATRIX TO SHOW TEACHER 1's LESSON 2

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C	1	76		2					2					1				1
	2			2						1								1
A	3								28								9	
	4			5	28				6						1			
T	5																	
	6						2	10										
E	7						1	3	3		1			2	2			
	8	4		14	7		5		154	6	8		5	7	15	37		12
G	9	1	3						3	3	1							
	10						1		9		1							
O	11																	
	12			1					4				1		1	1		
R	13	1		4	1		2		4					14				5
	14			4	2				17				1		18		1	
Y	15								38						1	3		
	16			3			1								2	4	12	
	17			2	5				1	2				8	3			30

MATRIX 4

A MATRIX TO SHOW TEACHER 1's LESSON 3

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	119		4					2	2	1							
C	2										1							
	3								34								11	
A	4	1		2	11				5									
	5																	
T	6			2			3	17								1		
	7			2	2		8	4							2	4		
E	8	5		20	6		2	1	237	6	26		4	2	13	44		
	9	3	1	1			1		1		1							
G	10			1					29									
	11																	
O	12								3							1		
	13			1			1		1									
R	14			1	1		2		12						12			
	15			3	1		1		40		1				2	6	1	
Y	16						5		3					1		3	23	
	17																	

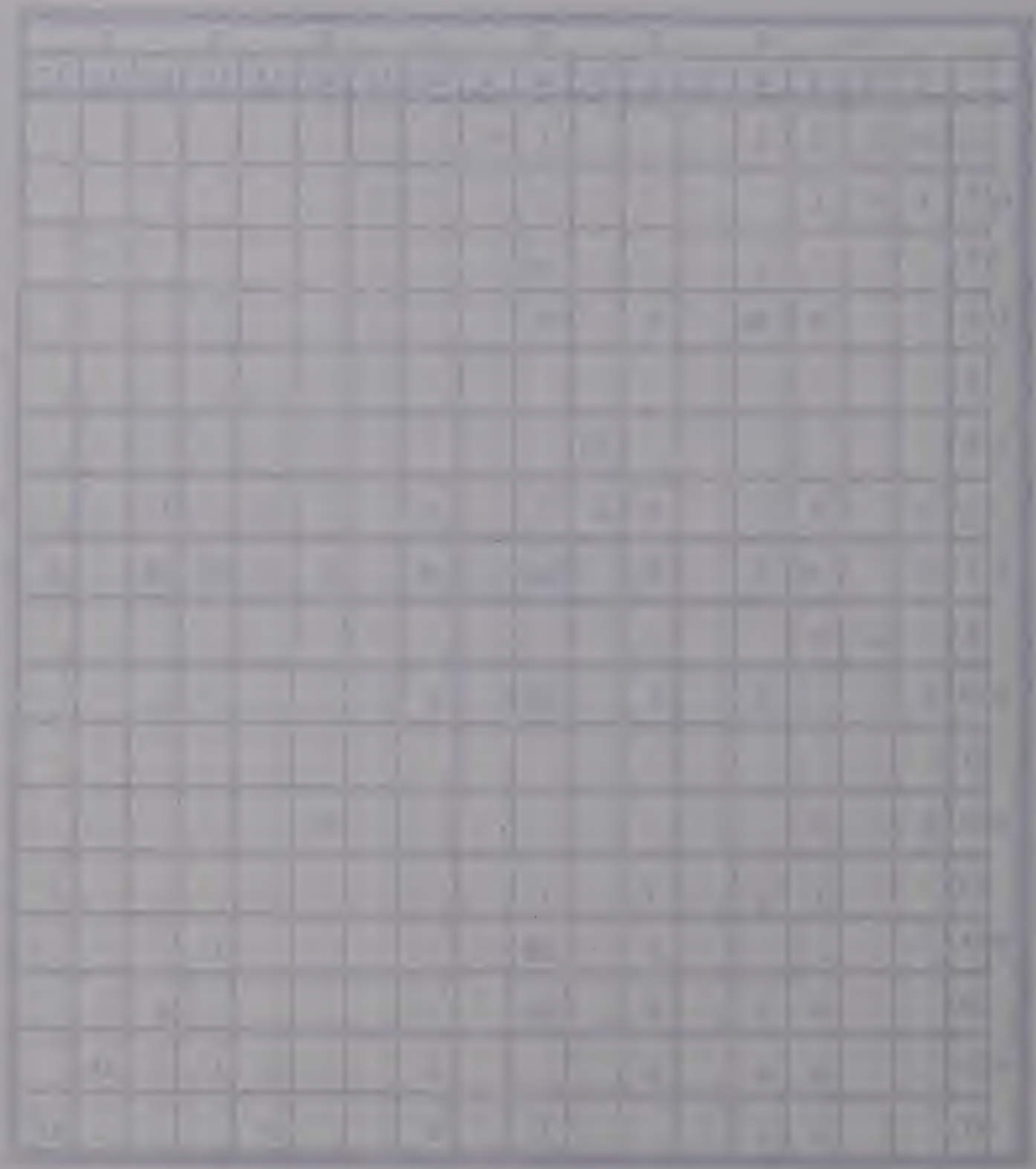
MATRIX 5

A MATRIX TO SHOW TEACHER 2's LESSON 1

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C	1	114	1	3	1				1	2	1							1
	2	3	8	1					1									
A	3				1				56								7	
	4			8	31		1		6									
T	5																	
	6							23										
E	7	1		7	1		8	4	1		2			3		1		
	8	2		37	5		6		146	4	11		3	2	20	23		6
G	9		4	2														
	10	2			1		1		12		2					1		
O	11																	
	12	1		2									1					
R	13			1	2		3		1					9				3
	14						2		19						1			
Y	15			2	1		1		21							9		
	16			1	1		1				2			1	1		16	
	17			2	1				1		1			5				15

MATRIX 6

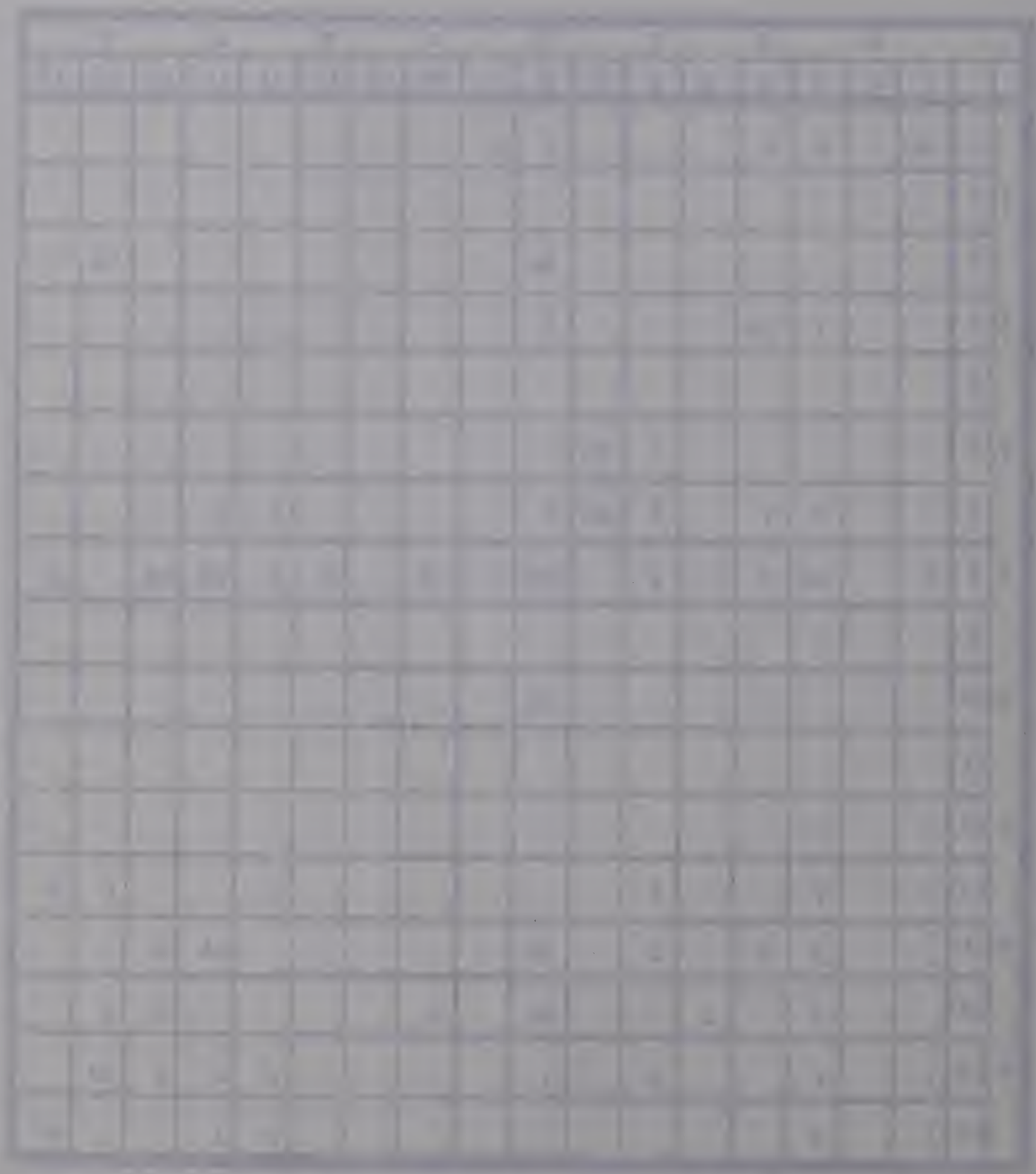
A MATRIC TO SHOW TEACHER 2's LESSON 2



		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C	1	48		4	2				1	1					1			
	2																	
	3								59								16	1
A	4			5	20				4					1				
	5																	
T	6						1	20										
	7			6	1		8	10	1					1	3			
E	8	2		44	7		4		181	1	13		3	4	24	10		2
	9			1														
G	10								14									
	11																	
O	12			1					2									
	13	3		2			1							4			1	2
R	14			3	1		2		29						14	2	3	
	15			2		1			8		1					4	1	
Y	16	1		7			4		1					2	4	3	43	
	17	1		2										2	1			9

MATRIX 7

A MATRIX TO SHOW TEACHER 2's LESSON 3



		C		A			T		E		G		O		R			Y
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	25		1					1									2
C	2								1									
	3			2	3				13						1	1	9	
A	4			2	21		2		23		2				4	2		
	5																	
T	6		2				2	15					1					
	7		4				12	1			4				1	2		
E	8	2	1	13	12		4		123		47		1	3	18	60		4
	9																	
G	10			1	4				49		5				1	10		
	11																	
O	12				1				1									
	13																	1
R	14			1	2		2		19		1				8	4		
	15			3	3		2		40		11		1	1		9		
Y	16						2				2					1	18	
	17			2	3			1										9

MATRIX 8

A MATRIX TO SHOW TEACHER 3's LESSON 1

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	93		3					1	2								1
C	2								1									
	3								27								9	
A	4			1	33		1		12						1			
	5																	
T	6						2	9	3					1				
	7			1	2		3	8	1		1							
E	8	5		24	9		5		245	2	33		3	6	27	19	.	4
	9	2	1	1					1	1								
G	10								35		1						3	
	11																	
O	12						1		2				1					1
	13	1					1		7				1	8				
R	14								26		1			1	9		1	
	15								19									
Y	16			5	3		1		1	1	2				2		11	
	17			2	1				1		1			1				15

MATRIX 9

A MATRIX TO SHOW TEACHER 3's LESSON 2

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	35		4	3					1								1
C	2	1														2		
	3								26								15	
A	4			1	25		2		14						1			
	5																	
T	6	1		2				27									1	
	7	1		4	1		12	5	5		1			1	2		1	
E	8	6	2	18	12		10		144	1	47			2	50	19		1
	9	1		1														
G	10			1			1		48								2	
	11																	
O	12																	
	13				1		1	1										
R	14								54		1				10	1	1	
	15								21								1	
Y	16			7	1		5				4				4		19	
	17			2														10

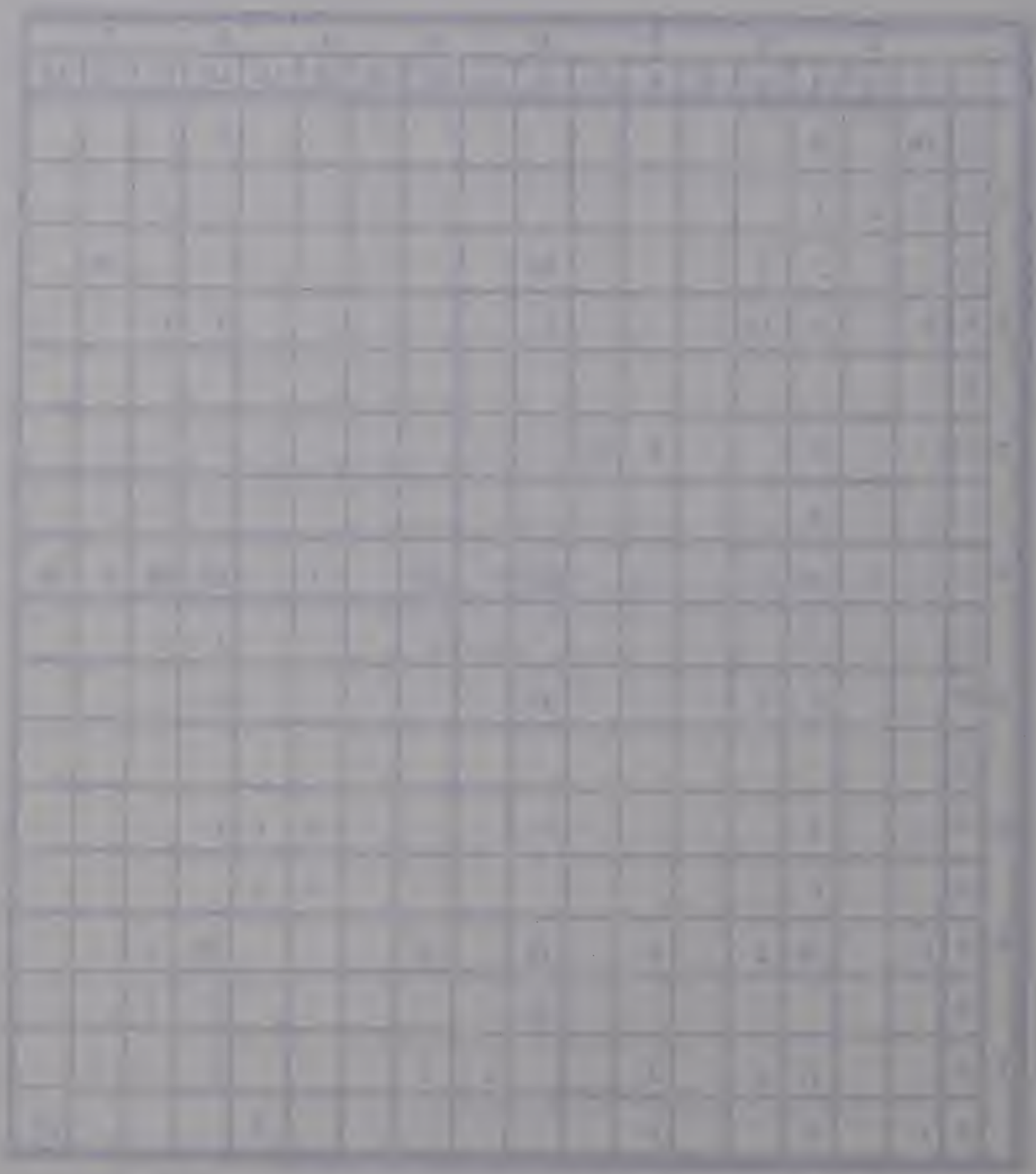
MATRIX 10

A MATRIX TO SHOW TEACHER 3/s LESSON 3

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	18		3											2			
C	2		1	1														
	3			1	2				45								34	
A	4	2		2	13				1						3	2		
	5																	
T	6			5			2	3										
	7			3														
E	8		1	26	4				219	4	22		7		15	62	1	10
	9			2						1	1				1	2		
G	10			2	1				21						3			
	11																	
O	12			3					4				2	1	1			
	13			1									2	3				
R	14	2		10	1		4		12		2				25	2		
	15								62						2	1		
Y	16			17	2		2			1	4				8	3	5	
	17	1		4			1							2				10

MATRIX 11

A MATRIX TO SHOW TEACHER 4's LESSON 1



		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	18		1	1		3									2		
C	2						1											
	3								42								36	
A	4			5	40				11					3				
	5																	
T	6	1		6			1	41										
	7	2		8	3		14		8	1	3				2	3	3	
E	8	1	1	38	7		9		133	1	7		6	3	40	13		2
	9	1																
G	10			8	2		7		17		1				2			1
	11																	
O	12			2					3				1		1			
	13			1	1				3									
R	14			1	3		4		40						14		2	1
	15						4		13						1	8	5	
Y	16	1		6	1		5				26				1	5	56	
	17										1				1			

MATRIX 12

A MATRIX TO SHOW TEACHER 4's LESSON 2

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	58		1	4		5							2				
C	2		2							1					1			
	3								27								24	
A	4			6	44				6					1	2			
	5																	
T	6	1						28										
	7	5		9			6	7			1			2	4		1	
E	8	3		18	5		8		167	2	15		2		33	8		2
	9	1	2	1														1
G	10			2			2		17		6				1	1	7	
	11																	
O	12				1		1		2									
	13	2			1				1					7			1	
R	14			2	2				35				1		6		4	
	15			3					8							8	4	
Y	16			9	2		6				11		1	1	4	5	25	
	17			1						1								4

MATRIX 13

A MATRIX TO SHOW TEACHER 4's LESSON 3

		C		A		T			E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C	1	18		5		1									3	1		
	2															1		
	3								87								21	
A	4			3	7				7						3	1		
	5					2									2			
T	6																	
	7								2									
E	8	5		75					105	1	2		2	4	32	14		2
	9			1														
G	10			1					8		3							
	11																	
O	12			1					3									
	13	1		4					1					3	1			1
R	14	2		12					21				2	1	28	11	1	
	15			8					11		1			1	6	14	1	
Y	16	2		4							8			1	4	1	20	2
	17			3										1	1			

MATRIX 14

A MATRIX TO SHOW TEACHER 5's LESSON 1

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1																	
C	2		3	1														
	3								58					1			16	
A	4			6	27				5									
	5								3									
T	6			1			1	2										
	7			2			1											
E	8			38	8	3	1		155	1			2	4	17	3		10
	9		1															
G	10																	
	11																	
O	12								2				2	1				
	13			5	2				1					12				2
R	14			1	1				15						5			
	15								2									
Y	16			9			2		1				1	3			22	1
	17		1	10					1					1				32

MATRIX 15

A MATRIX TO SHOW TEACHER 5's LESSON 2

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1																	
C	2																	
	3								42								18	1
A	4			1	8													
	5																	
T	6							7										
	7			3			2	1							2			
E	8			30	5				209		2		3	1	23	2		23
	9																	1
G	10								2								3	
	11																	
O	12			1	1		1		2				2	1			1	2
	13								1				1	2				2
R	14				1				25						3		2	
	15								2								1	
Y	16			9	1		2		2		3		2		2	1	34	3
	17			15	1		2		10	1			3	2				84

MATRIX 16

A MATRIX TO SHOW TEACHER 5's LESSON 3

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	13			2		1											
C	2		9		1													
	3			2	1		1	1	32								15	
A	4			4	20				3				1		2	1		1
	5																	
T	6			3			3	11		2					1			
	7			1	1		5	2							2	2		
E	8	3		27	2		4		110	4	33		9	1	20	28		8
	9			1	1				2		1		2					
G	10			1					35									
	11																	
O	12			2					10	2	2		1					
	13			2			1		1					6				1
R	14	1		3	3				17					1	10	2		
	15			2			3		27					2		7		
Y	16			1			4				7		1	1	1	1	1	1
	17	1	1	4					3					1	1			16

MATRIX 17

A MATRIX TO SHOW TEACHER 6's LESSON 1

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	46		4	1		2											2
C	2																	
	3			1					46	1							17	
A	4			4	20				7									
	5																	
T	6			4				10										
	7	1		4			2	5	2						1			
E	8	1		30	6		6		128	1	16		7	10	10	27		5
	9															1		
G	10			1					18									
	11																	
O	12			2					7				1					
	13	1			1				4									
R	14			3			1		9						11			1
	15			1			1		25								1	
Y	16			7	4		2				3				3	1	15	
	17	5		2										1				19

MATRIX 18

A MATRIX TO SHOW TEACHER 6's LESSON 2

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	40		6	1		5											
C	2								2									
	3								52								22	
A	4			5	15				4						1			
	5																	
T	6						4	22										
	7	4		16			2	3										
E	8	5		23	4		6		149	3	20		6	2	14	5		9
	9		2	1						1					1			
G	10						1		23		1							
	11																	
O	12				1				5									
	13			1			3		1									3
R	14			1					14	1	1				2			
	15								5									
Y	16	1		9	1		2							1	1		22	
	17	2		5	2		3				3			5				12

MATRIX 19

A MATRIX TO SHOW TEACHER 6's LESSON 3

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	46		5	1		2		1				3			1		1
C	2																	
	3				1			1	47		1						16	
A	4			3	15				5						2			
	5																	
T	6	2		2	1			4	2				1			2		
	7			2	4										1	3		
E	8	9	30				6		135	2	30		7	3	28	75		5
	9															2		
G	10								33							1		
	11																	
O	12	2		2					6				3			1		
	13			1									2					
R	14			7					27						22	2		
	15	1		5			2		80		2				2	17		
Y	16			2			2	1			3				3	4	11	
	17	1		2			1						1					5

MATRIX 20

A MATRIX TO SHOW TEACHER 7's LESSON 1

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	97		4	2		3		2				1					2
C	2								1									
	3								37								3	
A	4			5	22				6						1			
	5																	
T	6				1		1	14	1				1	2	1			
	7	2		3			2	2	3		1				2	1		
E	8	6		22	7	1	9		231	2	25		5	4	37	56		5
	9	1	1															
G	10								26									
	11																	
O	12	1							5				2		1			1
	13	2		1					3					4				
R	14								39						10		2	
	15								59									
Y	16			1			2								2		8	
	17	2		2	1				1				1					10

MATRIX 21

A MATRIX TO SHOW TEACHER 7's LESSON 2

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C	1	110		8	4				2					3	3			
	2		1	1														
	3								37								9	
A	4	2		5	25		1		1						1			
	5																	
T	6							8	1									
	7			1				2	1	1					2	3		
E	8	14		19	4		8		135	2	29		1	1	32	47		3
	9	1	1		1					1						1	1	
G	10								29								2	
	11																	
O	12														1			
	13	3							1					1				
R	14			3					35						9		1	
	15	1		2					52							9	2	
Y	16			4	1					2	2				3	4	27	
	17			2												1		11

MATRIX 22

A MATRIX TO SHOW TEACHER 7's LESSON 3

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	121		1					1	1				1				1
C	2		3	1					1	1								
	3								37								16	
A	4			1	21				13					1	1			
	5																	
T	6		1	1			3	14										
	7	1		4	1		6	2		1				1				
E	8			31	11		2		105	3	6		4	1	11	8		6
	9	2	2	2			1			1								
G	10								8		1					1	1	
	11																	
O	12								2				1	1		1	2	
	13	1		1	1		2		1					4				
R	14			1					11						1	1		
	15			2	1				7	1						4	1	
Y	16	1		3	2		5				5		2			1	30	
	17			1	2				2					1				22

MATRIX 23

A MATRIX TO SHOW TEACHER 8's LESSON 1

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	201	1	10	1				1	1			1	1				
C	2		1	1					1									
	3								34								8	
A	4	1			9													
	5																	
T	6			1				8										
	7			3			2	5	3									
E	8	8	1	18			5		155	3	4		5	1	12	12	.	4
	9	1		1									1			2		
G	10								4									
	11																	
O	12			1					2				4	1	1			2
	13	2							1					1				
R	14								13						2	1	1	
	15								15									
Y	16	3		4			1								1		37	
	17	2		2			1						1					9

MATRIX 24

A MATRIX TO SHOW TEACHER 8's LESSON 2

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	189		11	2				2				1					1
C	2																	
	3				1				31								20	1
A	4	1		1	51		2		2					1	5			
	5																	
T	6			3	1		1	7							1			
	7			2	1		1	3						1	1	1		
E	8	8		15	1		2		88	1	2		4	4	10	1		2
	9			1														
G	10								2							1		
	11																	
O	12	1		1					3				1					
	13	1			3				1					5				
R	14			8	1		3		8						15	1	1	
	15	1		4					1						1	3	1	
Y	16	2		9		2					1				4	4	43	
	17	1		2	1				1									9

MATRIX 25

A MATRIX TO SHOW TEACHER 8's LESSON 3

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	44		3	1													
C	2																	
	3								27								10	
A	4			2	12				5						2			
	5																	
T	6			1			2	1										
	7			1														
E	8	5		21	7		2		160		18		2		30	22		
	9																	
G	10								20									
	11																	
O	12								2									
	13																	
R	14			2					32						8			
	15			1					22		1				6			
Y	16			2					1		1				2	5	5	
	17																	

MATRIX 26

A MATRIX TO SHOW TEACHER 9's LESSON 1

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C	1	65		6						1								
	2																	
	3								43								11	
A	4			7	25				8						2			
	5																	
T	6			4				4						1				
	7			1					1		1							
E	8	7		22	13		7		210	1	16		1	1	26	21		1
	9									1								
G	10			4	1				16		1				1			
	11																	
O	12								1									
	13			1			1											
R	14			4	1				27						11	2		
	15								18							2	1	
Y	16			5	1						4					1	15	
	17				1													2

MATRIX 27

A MATRIX TO SHOW TEACHER 9's LESSON 2

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	59		5			1											
C	2																	
	3								29								13	
A	4			1	6				9									
	5																	
T	6			3				5										
	7	1		2	1			1	1									
E	8	6		22	8		1		149		9		3		17	4		1
	9																	
G	10								9								1	
	11																	
O	12	1		1					1				1		1			
	13																	
R	14			2			1		17						6			
	15			1					4									
Y	16			3	1		5		1		1				2	1	29	
	17			1														1

MATRIX 28

A MATRIX TO SHOW TEACHER 9's LESSON 3

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	5		1			1											1
C	2																	
	3								33								30	
A	4			4	18				5						7			
	5																	
T	6			13			1	15										
	7						10	2	1		1				1	3		
E	8			21	8		6		147		11				31	56		17
	9																	
G	10				2				9									
	11																	
O	12																	
	13																	
R	14			9	2				28						20		1	
	15			1			3		62		1					2		
Y	16			9	2		11				2				3	6	26	
	17	2		3	1				11									9

MATRIX 29

A MATRIX TO SHOW TEACHER 10's LESSON 1

		C		A		T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	17		1	1													
C	2																	
	3								39								14	
A	4			4	26		1		9						1			
	5																	
T	6			3			1	16										
	7			2	1		8	5	1		2				2			
E	8	2		28	10		5		202	1					39	13	.	4
	9														1			
G	10			3			1										1	
	11																	
O	12																	
	13																	
R	14			1	1				41						2	1		
	15				1				13							2		
Y	16			6	1		4				3				2		34	
	17			3			1											20

MATRIX 30

A MATRIX TO SHOW TEACHER 10's LESSON 2

		C		A			T		E		G		O		R		Y	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	1	77		2	2		1											
C	2																	
	3								40								16	
A	4			7	25				6									
	5																	
T	6			9			1	24	1									
	7	1		4	2		12	6	4		1							
E	8	3		22	5		11		274	7	1				39	9		6
	9			4	1				2									
G	10				2				1						1			
	11																	
O	12																	
	13																	
R	14				1				39									
	15								9									
Y	16			7			8				2						37	
	17	1		1			2		2									9

MATRIX 31

A MATRIX TO SHOW TEACHER 10's LESSON 3

B30098